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“UNTO THE THIRD AND FOURTH GENERATION:” A STUDY IN EUGENICS

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PHRASES, be they prose or poetry, which became ours in childhood, remain as our surest possessions. They may have had little meaning for us when first heard; they may have become part of ourselves by no conscious effort, through the mere force of iteration, but all the same they are apt to appeal to us, to be a part of our consciousness in a way that expressions of later acquirement cannot nearly approach. Thus it was that, casting round for a title for my talk to you this evening, the old phrase obtruded itself that, droned out Sunday after Sunday in the little village church of my boyhood, had become part of my being.

I do not know that it is a happy title; it inevitably suggests a text; it is pretty sure to have suggested that I am to indulge in a moral disquisition, when I am going to do nothing of the sort. I shall, it is true, have to dwell upon matters which constitute the basis of morals; that is inevitable in any discussion upon eugenics. These are matters which the public is accustomed to contemplate from their moral aspect, from the aspect of the soul's good, whence it follows that the same pensive public labels everything connected with them as immoral. Medical men, on the other hand, weigh and discuss them from the point of view of the body's good.

Thus, while admitting freely that body acts on soul, and soul on body, that the health of the one depends largely upon the health of the other, nevertheless, as a medical man I must treat my subject in an unmoral manner—nay more, I believe that we medical men accomplish most for the good of our fellows when we expose the cold

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facts bearing upon heredity and eugenics without reference or recourse to morals. The cobbler does best if he sticks to his last. Wherefore I would ask you to understand that my title means merely this, that I want to discuss the effect of parental well-being upon the progeny, that I have been driven to employ this title because it reflects the almost universal confusion between sexual health and morals, and, I may add, because with that confusion, it pictures what, until the end of the nineteenth century, accurately figured the general belief, namely, that conditions affecting the parents influence the children even unto the third and fourth generation.

The last two decades, with the advent of Weismann, have registered a change in authoritative opinion. Weismann, in Germany, and before him, Francis Galton, in England, have through their writings convinced the world that properties acquired by the parent or parents are *not* inherited by the children. If we accept the doctrine of the continuity of the germ plasm (and the researches of the cytologist and embryologist show that we must accept it); if, further, we clearly recognize that that only is inherited which is or becomes the property of the individual at the moment of origin of that individual, at the moment that is, when the germinal matter of the male parent fuses with the germinal matter of the female parent and these twain become one, and that every property obtained by that individual after this event cannot be inherited, but is acquired—if we accept these two fundamental ideas, it has seemed inevitable that we must assent to this newer teaching.

Saying this I know perfectly well that in his later writings Weismann made an admission which largely modified his theory. He admitted that the germ cells might undergo modification while in the body of the parent. But your ordinary man is impatient of parenthetical qualifications. He grasps at broad general statements, and the public is to be pardoned if one important qualification has escaped it when, in successive publications, the Freiburg philosopher introduced so many subtle distinctions and qualifying conditions that it demands not a simple paragraph, but a course of advanced lectures, accurately to state the Weismannian theory of inheritance. The modern, popularly accepted doctrine is that acquired conditions are not inherited, and as a corollary, that the germ cells are unaffected, no matter what vicissitudes are undergone by the body at large—or if you will, by the body of the parent at large.

Do you see where this doctrine leads us? The sins of the

fathers, so say these latter day prophets, do not tell upon the children. They prophesy soothly that, no matter how the parent ill-treats his body prior to conception, the progeny is unaffected: a man may have tuberculosis or syphilis and provided he does not give the disease to the mother and so bring about infection of the foetus in the womb or in its passage to the outer world, the child is likely to be as strong and healthy as that of a perfectly sound parent. This, in fact, is being proclaimed, and widely proclaimed, at this very time; that the children of the slums and of degraded parentage, provided they are brought to Canada and given a healthy life upon the farm, develop into citizens of as good quality, citizens every whit as good, as those of good parentage. "Nurture" is everything, and "nature" negligible.

If the observed facts do not tally with this view, then we are told that the incidence of particular conditions in the offspring is due to diathesis: that the parent is not to blame; he succumbed to tuberculosis or alcohol in the first place because he inherited a weakened constitution from parents who had themselves succumbed; thus both father and child possess a stigma of degeneration that originated, Heaven knows how or when, in the family history; that bad stocks and feeble-minded and vicious families (and we have pedigrees of such stretching back for many generations) have arisen either by chance (they call it "mutation"), just as, for example, Cain had bad blood in him—or are to be traced back through countless ages, presumably to a mingling of the blood of Cain's stock, after he married that very shady personage, Lilith, of the nocturnal land of Nod, with the more respectable later offspring of Adam.

Or again, we are told that the observed weakness of the child of diseased parentage is not inherent, but due to environment: the child was born healthy, but the poor food and wretched surroundings into which he was born—the home conditions in the family of the drunkard or tuberculous—have prevented a healthy bringing up. Now let me state that I am sufficiently old-fashioned to repudiate this new-fangled "Weismannism."

I still hold on to the belief that the sins, so-called, of the parents against the body—or at least a very important series of such sins—may influence the progeny to its hurt. And what is more, I believe that these new-fangled ideas have their origin in the narrowness, and, if I may so say, chauvinistic provincialism of the zoologist. Those zoologists are, if I may so express it without offence, materialists of the most limited outlook; they are capable of recog-

nizing only such changes as render themselves visible in the size and shape of parts; the more subtle changes of function, of chemical and physical activity, are outside the limits of their vision and to them are non-existent. One has only to consider for a moment to realize that underlying and determining the shape and structure of parts is the chemical composition of the same. The shape, and indeed the size, of any organ or part of the animal or vegetable body is the expression of the interaction between matter of a particular composition and its surroundings or environment. Our ultimate theory of inheritance must, therefore, be not morphological, determined by the shape of parts, but chemical, if not physical, determined by the properties of living matter. The wonderful chemical investigations of the last few years indicate that the molecules of matter endowed with life are of such extraordinary complexity of composition that they may undergo, nay, are constantly undergoing, fine changes in composition in the performance of function, without their general underlying structure being altered. There may be fine changes in the composition of the living molecules resulting in change of properties of first importance for the organism as a whole, without any immediate structural change showing itself in the individual. It is only when the alteration of environment has rendered these changes fixed and permanent that we can expect to find permanent morphological changes. It follows, therefore, that the first indication of altered state of the individual and its progeny tend to be ultramorphological, and that the methods of the morphologist, that is to say of the morphological zoologist and botanist, are not fitted to unravel the problem. They do not begin at the beginning.

In order that you may grasp the problem, let me put rapidly before you in graphic form the fundamental facts concerning the physical basis of inheritance.

We know, in the first place, as a matter of universal knowledge, that the individual, be it animal or plant, is liable to inherit properties equally from both father and mother. It may happen that in one family the progeny in the main appear to take after the mother, in another they equally are seen to have a greater resemblance to the father; in yet another, perhaps in most, some children take after the one parent, others after the other. Broadly, in the act of conception, the new individual receives heritable matter from both parents.

If now we enquire more particularly into the details of the process, we find that the zygote, the fertilized cell from which the

whole future individual becomes developed, the new individual in fact, has a remarkable composition. In the fertilized ovum, or zygote, the cell body or cytoplasm is afforded by the mother—is supplied by the ovum. The amount of cytoplasm contained in the tail of the spermatozoon is so minute as to be not deserving of consideration except in regard to the midpiece which supplies the centrosome or minute portion of cytoplasmic matter which initiates cell division (Fig. 1). *The one constituent which is afforded equally by both male and female cell is the nuclear matter.* Approximately equal portions of nuclear matter are contributed by the two parents to constitute the nucleus of the single cell which gives origin in the whole new individual (Fig. 2).

Here, therefore, in this nuclear material must be conveyed all the heritable and characteristic properties of the father and mother.

Next, it has to be borne in mind that, from the very beginning, in that process of cell division and multiplication which ends in the production of the fully formed individual with all its distinct tissues and organs, the cells which are destined to give origin to the germ cells, male or female,—to the spermatozoa and the ova,—are kept apart from those giving origin to all the rest of the body. Those other cells, as they multiply, become more and more altered in one or other direction, until some, for example, become bone cells, others nerve cells, others gland cells, and so on (Fig. 3). But the germ cells remain simple, or, as we term it, undifferentiated, throughout. At most, just prior to discharge they undergo a process of reduction whereby the chromomeres, or nuclear units, are halved in number, so that when the spermatozoon and ovum come together, the nucleus of the zygote, formed by the junction of their two nuclei, contains the number of "chromomeres" or nuclear units proper to that particular species, instead of being doubled in each successive act of fertilization (Fig. 4).

This, it always seems to me, is the central miracle of descent. Each one of us—and every living multicellular being—with all our extraordinary complexity of parts and organs, is developed from a simple undifferentiated cell—the egg—and that cell in its turn is not originated by the piecing together of minute elements from all the different tissues and organs of the parent, but is a direct descendant of the undifferentiated germ cells of the parents and grandparents. The germ plasm, as such always remains undifferentiated—the cells composing it always remain simple. This is what is meant by the continuity of the germ plasm. The germ cells give rise to the soma, and at the same time to the next generation of germ cells,

while the soma gives rise to nothing but itself, and ultimately perishes. Death is inherent in the soma; the germ cells have the potentiality of carrying on the torch of life through unending generations—or, in other words, the germ plasm is potentially eternal. These germ cells divide, and divide giving origin to similar simple cells, until such time as one of them, becoming discharged, encounters a germ cell of the other sex—and the result of the combination of the two is that marvellous complex of cells of all orders, the animal body, enclosed in which is a group of unaltered cells, the germ cells, which, in their turn, undergoing discharge, are capable, upon fertilization, of helping to give origin to another complex individual (Fig. 5). Thus, to express this order of events in scientific language, the undifferentiated germ cells or blastogenic cells give origin to the soma or body, composed of blastogenic and somatogenic cells. The blastogenic cells are passed on from generation to generation in an undifferentiated condition.

It is obvious that if an adult individual loses, for example, an arm, that loss does not reproduce itself in each of the hundreds of ova situated in the ovary, if the individual be a female, or the billions of spermatozoa in the testes, if the individual be a male. *Acquired deformities*, as such, are *not* reproduced in the progeny. Weismann, for instance, cut off the tails of twenty successive generations of rats, and the twenty-first generation had as well developed tails as had the first. Nor, again, will the shrinkage of a part in the parent, brought about by want of use, lead to small size of the same part in the offspring. The woman who takes no exercise, and whose biceps as a consequence is flabby and miserably small, does not necessarily have a child with small biceps. The accompanying poor nutrition of the mother, it is true, may tell upon the vigour and vitality of the child; it may be puny and miserable; but the whole body will be affected and not one particular part.

Thus far we wholly agree with Weismann, and with his statement:¹ "By *acquired* characters I mean those which are not preformed in the germ, but which arise only through special influences affecting the body or individual parts of it. They are due to the reaction of those parts to any external influences apart from the necessary conditions for development. I have called them *somatogenic* characters because they are produced by the body or soma, and I contrast them with the *blastogenic* characters of an individual, or those which originate solely in the primary constituents of the germ (*Keimes Anlagen*). It is an inevitable consequence of the theory of the germ plasm, and of its present elabora-

tion and extension so as to include the doctrine of determinants, that somatogenic variations are not transmissible."

Now this, we admit, is an inevitable consequence of the theory, but let us see whether it is an inevitable consequence of the facts. In other words, is it not possible, and have we not evidence to prove, that modifications of the soma or body which originate during the lifetime of the individual independent of any inheritance, may affect the germ cells in such a way as to bring about a like modification in its body?

Let us proceed by stages. First, do we possess evidence that the germ plasm in the germ cell is capable of modification outside the body, or is it absolutely fixed and inert until such time, it may be, as it is stirred to activity by the attraction to and fusion with a germ cell of the other sex? Perhaps the clearest evidence that it is susceptible to outside influences is afforded by Bardeen's experiment.² It is possible to fertilize frog *spawn* experimentally outside the body by collecting and discharging over it frog *sperm* and from this fertilized spawn to obtain perfectly developed frogs. But now, if the sperm be subjected for a short period to the action of *x*-rays and then be employed for fertilization, the eggs segment and the early larval stages are passed through, but the process of development is arrested in a few days—the larvæ all die prematurely. None survive beyond the second week. Obviously the germ plasm in the spermatozoa is acutely susceptible to the action of this physical agent.

Next, have we evidence that the germ plasm in the germ cells is capable of modification during the time that it exists in the body of the individual prior to ripening? To this question, again, the answer must be an unhesitating, yes. Quite the most striking evidence is that afforded recently by Tower.³ Tower made the remarkable observation that if shortly before the maturation of their germ cells, ova and sperm, he subjected potato beetles to intense environmental change, to cold and humidity, he obtained offspring widely different from the parents—and what is more the results appeared to be permanent, or at least heritable through further generations. The elytra or wing cases of the normal beetles showed one pattern, those of the progeny of the cooled beetles showed another. When crossed, these altered forms bred true, nor did they lose their acquired characters in subsequent generations. Similarly, among plants, Macdougal⁴ has shown that in the evening primrose by injecting certain chemical solutions into the immature ovaries, and so by subjecting the oocytes or female

germ cells to certain chemical agents, he obtained seeds which afforded plants, some at least of which departed widely from type: he established new varieties.

In the body the germ plasm is capable of being influenced by physical and chemical agents. This is evidence of the first importance for us as medical men. We have long observed that intoxicants affecting the body of the parent are liable also to affect the germ cells, but our morphologist confrères, zoological and botanical, have given as much heed to our data as did the priest and the Levite to the wounded man of the parable. They have not thought them worth even twopence. And that because our observations deal almost wholly, not with morphological variations, but with functional change.

Let me indicate the data to which I refer. I have brought them forward on previous occasions and they have never been contradicted. Take Constantin Paul's figures collected in the fifties.⁵ Of thirty-two pregnancies in which the husband alone was exposed to lead in the course of his work, there resulted twelve abortions, and of the twenty children born alive, eight did not survive the first year, four died during the second year, five during the third. The thirty-two pregnancies yielded only three children living beyond the third year. What can this mean other than that the lead had influenced the germ cells of the fathers. Nor is this all, Paul, Roque, Sir Thomas Oliver, and other investigators have called attention to the great frequency of epilepsy, idiocy, and imbecility in the children of workers in lead, and it is well established that such feeble-mindedness, where not of sufficiently high grade to cause barrenness, is passed down to later generations.

We have identical data regarding workers exposed to the fumes of nitrate of mercury. (Lizé.⁶)

	Number of Cases.	Number of Pregnancies.	Abortions, Premature labour, and Still-births.	Surviving Infants.	Remarks.
Mother alone exposed.....	3	7	4	3	
Father and Mother exposed.....	2	14	5	9	Of these, only three survived fifth year.
Father alone exposed.....	?	12	4	8	Of these three died before fourth year. One alone vigorous.

How about the commonest of all intoxications, the alcoholic? You will know, perhaps, that there is waging at the present time, an active discussion upon this subject—that Karl Pearson,⁷ for instance, the notable statistician and Galtonian Professor of Eugenics in the University of London, has compiled some remarkable statistics to show that the children of alcoholics in Edinburgh are if anything superior in capacity to those of abstainers. "Auld Reekie," we admit, is a great city, and its inhabitants are popularly said to consume much alcohol, but this has been a little too much to swallow, and so Sir Victor Horsley⁸ has followed upon Professor Pearson's tracks, has seized upon his figures and rent them in a manner fearful and wonderful to behold.

Let me admit that the subject is so complicated that it is difficult to arrive at a clear comprehension of the exact state of the case. The home misery and poverty, for example, brought about by alcoholism, place the offspring at a disadvantage from the very onset. If the mother be an alcoholic, then the child, nourished by the maternal blood, is liable to malnutrition and to show intoxication while growing in the womb. When, however, we come to compare the family statistics for confirmed alcoholics and for the ordinary temperate population, there can be no doubt but that alcohol is responsible for an appalling amount of early death. The vitality of the offspring is gravely affected and, for myself, from families of alcoholics observed by me, I cannot but feel that the children of confirmed drunkards show an increased susceptibility to the action of relatively small amounts of alcohol.* It is, however, by experiment in which we can cut out all complicating factors that we gain clear proof of the deleterious action of alcohol upon the germ cells, and so upon the next generation. Only recently Stockard,⁹ has published some most conclusive observations. Employing guinea pigs, he placed them in a state of chronic alcoholism by treating them for six days per week with alcohol fumes almost to the point of intoxication. Forty full term matings of various combinations were made with these animals. Treated males were paired with normal females, treated females with normal males, treated males with treated females. Altogether twenty-five out of the forty matings either gave no result or the embryos aborted early and were eaten by the mother. Fifteen matings produced in all twenty-five young (in place of about seventy), of which at the time of writing, two had reached maturity, four were young

*A view amply supported by the more exact observations of Legrain *Heredité et l'Alcool*, Paris, Doin, 1889.

but seemed normal. Of the remaining nineteen, eight were still-born or aborted, seven lived for a few days after birth and then died in convulsions, four were in utero when the mothers were killed, and of these one was deformed. Professor Stockard has been so good as to write to me the exact details of what is the crucial test of this action of alcohol upon the germ cells, namely, of the pairing of treated males with normal females—crucial because in the opposed pairing of treated females with normal males it may be objected that the ill effects are due to the disturbances induced by the maternal blood while the offspring are in utero, are acquired and not inherited. There were twenty-four such matings.

RESULTS OF TWENTY-FOUR MATINGS OF ALCOHOLIZED FATHER
WITH NORMAL MOTHER (GUINEA PIGS)

14 matings gave early abortions or were negative.
5 matings gave still-born litters (in all 8 young).
5 matings gave living litters (in all 12 young).

Of the twelve living young:

Died in convulsions soon after birth.....	7
Survived.....	5

The twenty-four matings yielded five surviving young, and when two months old these five survivors were half the usual size. The average litter of the healthy guinea pig is between four and five. Therefore under the influence of alcohol twenty-four matings only produced as many surviving young as might be expected from a single pairing of two healthy animals.

There could be no clearer, more positive evidence afforded of the effects of alcohol upon the next generation. The accompanying table by Dr. Mott shows that parallel results are encountered in man. (See page 973).

Let us pass to the consideration of another group of poisons. Nowadays I take it every school boy knows that the bacteria and other microbes of infectious disease produce their effects by the chemical substances which they liberate into the blood during their growth in the body or when they die in the tissues. The infections, therefore, are one form of intoxication. Do the bacterial poisons circulating thus in the blood influence the germ cells? Here, again, the general sense of the medical profession, the accumulated result of individual observations, has long been to the effect that they surely do.

EXAMPLE OF DRUNKEN FATHER AND INSANE OFFSPRING

FATHER. Born 1830. No family history of insanity, fits, or nervous disease. Chronic drunkard from boyhood. In asylum, June 12th to July 11th, 1876; and January 19th to February 8th, 1892.	MOTHER. No history of insanity in family.
Daughter. Born 1859. Admitted to asylum Oct. 24th, 1874. Discharged and readmitted on subsequent occasions. Still in asylum.	Daughter. Born 1862. Admitted to asylum Oct. 6th, 1874. Discharged and readmitted on subsequent occasions. Still in asylum.

Time and again the practitioner has observed a relationship between chronic or acute infection suffered by either parent and abortion, blighted ovum, still birth, or monstrosity. And we have more exact observations; investigators like Gheorghiu, come to our support. Gheorghiu¹⁰ made an extended enquiry into the

health conditions of the parents in a long series of monstrous births occurring in the Paris hospitals, and his statistics show most convincingly that there is a direct relationship between parental tuberculosis, syphilis, and acute infections affecting one or other parent and these gross examples of maldevelopment.

Time and again, also, the ordinary practitioner has been convinced that the children of those suffering from tuberculosis and syphilis are not merely of lowered vitality, more liable to succumb to childish ailments, but, notably in the case of tuberculosis, exhibit a peculiar liability to succumb to the same parental disease, exhibit in short a diathesis. But here again conditions are so complicated that it is difficult to secure a series of absolutely decisive cases. Not only have we to weigh carefully the possible influence of the disturbing factors noted in connexion with alcoholic intoxication— influence of maternal malnutrition upon the growing embryo, of bad nutrition and environment during childhood, and so on, but in addition there has to be discounted the possible direct acquirement of the infection by the foetus from the mother during pregnancy or parturition, or again by the suckling infant. For a sure answer we have once more to appeal to experiment—and experiment once more gives an affirmative answer. Carrière, for example, inoculated a series of guinea pigs, both male and female with the toxines or soluble products of the tubercle bacillus.¹¹ Here are his results:

TUBERCULOUS TOXINES—CARRIÈRE

	Still-born.		Died before 16th day.		Survived.		Total Births.
	No.	Per cent.	No.	Per cent.	No.	Per cent.	
Male and female both inoculated	13	52.0	7	28.0	5	20.0	25
Female alone inoculated.....	7	26.9	9	34.6	10	38.4	26
Male alone inoculated.....	5	16.6	3	10.0	22	73.3	30

You will see from this table that the circulating toxines have had a very definite effect in reducing the numbers of the litters and increasing the numbers of the still-born progeny.

Similar results have been obtained by Lustig¹² working with chickens, and Watson,¹³ working under Mott in London, employing guinea pigs, when they made successive inoculations of a very toxic vegetable extract, abrin, which in its properties closely resembles the bacterial toxines. Both obtained diminished fertility, increased number of monstrous births, poor vitality—and both, like Carrière

in the case of tuberculin, note particularly that the offspring of the animals subjected to these toxines, instead of being rendered more resistant to the particular vegetable poison, were, on the contrary, distinctly more susceptible. This is wholly on a par with the common observation of medical men that the children of those suffering from advancing tuberculosis are more liable to succumb to tuberculosis than are those of healthy individuals.

Let me now for a moment gather up the threads of my argument. I have proved to you: that the essential germ plasm which conveys the heritable characters from generation to generation is not inert and incapable of being influenced, but on the contrary is susceptible to physical and chemical agents affecting the body and circulating in the blood; that intoxicants and the poisons of infectious disease have a deleterious effect upon the offspring; that they are apt to cause relative infertility, still-births, monstrosities, and imperfect developments, lowered vitality with tendency to death during infancy, instability and imperfect development of the nervous system showing itself in convulsions, epilepsy, imbecility, and insanity; also that with some intoxications the offspring are rendered more susceptible to the action of the particular agent which had poisoned one or other parent.

It is rather a ghastly record. The only comfort to be extracted is this, that if there are agents which thus act deleteriously upon the germ cells, while in the bodies of the parents, it is equally certain, that there must be other agencies capable, in favourable conditions, of benefiting the germ plasm and improving its qualities. Favourable environment thus leads to improvement of the race and progressive evolution.

I have still, it will be seen, to take up the question as to whether, not these introduced poisons but influences primarily affecting the body can, secondarily, have their effects upon the germ cells—in other words whether there are any orders of conditions acquired by the body of the individual—somatogenic changes—that can affect the germ cells and so affect the offspring, producing the same order of change as had been brought about in the parent. Not to beat about the bush, let me recount to you two recent observations, one from the animal, one from the vegetable, world. Sumner¹⁴ has shown that if similar broods of young mice be brought up, the one in a warm temperature (about 21°C.), the other in the cold (about 5° C.), they show recognizable differences in growth. The mean (average) length of tail, of feet, and of ears of those brought up in the warmth is distinctly greater than of those kept

in the cold. And here is the important fact: the young of the two groups, although reared together in a common room, all, that is, subjected to the same temperature, continue to present the greater or lesser growth of tail, foot, and ear acquired by their parents. Bordage's observation is of the same order.¹⁵ Ordinary peach trees planted in the warm climate of the Island of Réunion or Mauritius from being deciduous gradually acquire an almost evergreen habit—and now if seedlings from these trees be grown elsewhere in a cooler climate, these seedlings manifest the same tendency to be evergreen and not deciduous. Of course it may be urged, it has been urged, that in both these cases the germ cells were subjected to the same temperature changes as were the bodies of the parent individuals, that these are not, therefore, necessarily examples of inheritance of properties of *somatogenic* acquirement. Quite so. But certainly, in the first place, for our purposes, whether they are instances of the somatogenic or blastogenic inheritance of acquirements is of minor importance, and, in the second place, they afford further proof of the susceptibility of the germ cells to modification in their properties. For us as students of medicine the point of especial interest is that the work of the last decade has developed greatly our knowledge of what we term the internal secretions. We find that many of the glands of the body, such as the thyroid, the adrenals, the pituitary, the ovaries, and testes, not to mention the liver and the mucous membrane of the intestine, in their normal activity discharge into the blood substances which, carried to other organs, not merely influence their work but are absolutely essential to the proper carrying out of their function. We recognize, in fact, a series of diseases due to the excess or the defect of these internal secretions—conditions such as exophthalmic goitre, myxedema, Addison's disease, acromegaly, and so on—while other so-called metabolic disturbances, such as adiposity, gouty states, etc., are being increasingly recognized as closely allied. If the cells of particular organs are highly susceptible to these "hormones" and other active principles of the secretions of other organs, surely is it not likely that the parent germ plasm, the cell matter which by its active growth is capable of giving origin to all these organs and tissues, should likewise be susceptible to their action, and influenced by their excess or deficiency? Nay, should we not expect that bodies of this nature developed by the cells in their activity should act with greater ease upon the living substance of the germ cells than extraneous drugs are likely to act. As a matter of fact, alterations in such glands as the thyroid, the pituitary,

the adrenal cortex, the pineal, are found to have a profound influence upon the sexual function. In certain cases this is arrested, in others stimulated to premature activity. I will only say here that evidence is accumulating to prove that influences acting upon these organs of internal secretion, conditions acquired by these organs, tell upon the germ cells, and are apt so to modify them that the offspring in their development show excess or deficiency in the function of the glands implicated in the parents, that so conditions acquired by the parents reproduce themselves in, and become inherited by, the offspring. I will not say that this is wholly proved—it is not—but I would lay down that it is along these lines that the direct inheritance of morbid states will most surely be demonstrated.

But this *inheritance* of disease is far from being everything. There is, from the point of view of eugenics, another equally important section of my subject. I have only so far discussed true inheritance, conditions in which disturbances impressed upon the germ cells before fertilization affect the offspring. I must at least glance at the terrible effects of congenital disease, and more particularly of infections conveyed to the growing individual while in the womb or during parturition. With a fuller realization of the frequency of these congenital diseases, of the havoc these are playing upon individual lives, the misery, ill-health, and ruin that they inflict, with the surer recognition of the presence and after-effects of what euphemistically we speak of as the contagious diseases, brought about by more exact methods of diagnosis, such as the Wassermann reaction and the actual recognition under the microscope of the gonococcus and the spirocheta pallida, we have, during the last decade more especially, come to a realization of the hideous frequency of these diseases and their ill-effects upon the innocent of the second generation.

When it is accepted that at least a half of gynaecological practice is due to gonorrhœa and its results, that a large proportion of the cases of infantile blindness is of gonorrhœal origin, that, as demonstrated by the Wassermann test, practically all cases of locomotor ataxia, and nearly all cases of general paralysis of the insane are of syphilitic origin; when we know that most cases of multiple successive abortions are syphilitic, and recognize the puny, miserable parodies of humanity doomed in most instances to an early death, that too often are the result of syphilitic disease in the parent; when we realize the preventible ills that follow in

the train of these venereal diseases, I wholly agree that the time has come when we should no longer refer to these matters by circumlocutions, when for the good of the coming generations we should openly wage war against gonorrhœa and syphilis, and above all should, for the safety and welfare of our children, instruct them as to the dangers they must ward against—not merely on account of their own health and happiness, but for the sake of the generations yet unborn.

At the Dominion Day dinner in London the other day, after listening to Mr. Foster's magnificent oration, the agent-general for Australia, strong at heart in the knowledge of what the Commonwealth was accomplishing in the matter of imperial defence, said drily that if it depended only upon Canadian talk then surely the safety of the Empire was assured: there would be Dreadnoughts to spare. We have to confess humbly that in more than one matter, while we are talking, Australia has been doing. Melbourne has led the world in a census upon the extent of syphilitic infection in her midst.* At the meeting of the Australian Medical Congress two years ago a resolution was passed to the effect that syphilis is responsible for an enormous amount of damage to mankind, and that all preventive and remedial measures against it are worthy of the utmost consideration. This resolution was presented to the government of Victoria accompanied by the statement that there was a sharp difference of medical opinion respecting the extent and distribution of the disease. Acting under the advice of its chief health officer, Dr. Ham, the government sanctioned a collective investigation with the aid of the medical profession in Melbourne. The government thereupon appointed an expert, Dr. Conrad Hiller, to make the official tests; syphilis was made a compulsory but impersonal, notifiable disease for a period of twelve months within the Melbourne area; medical men were instructed to report cases and send a specimen of the blood to be examined by Dr. Hiller. Certain suspicious conditions, like thoracic aneurysm, multiple abortion, death of three children in a family under five years of age, were also to be notified.

In all, fifty-five hundred cases were reported during the twelve months. For four months, at the end of the period, all the cases visiting two of the hospital clinics (eye, ear, nose, and throat cases) were tested. The results showed that out of a hospital population

* I see from "Problems in Eugenics, paper communicated to the first International Eugenics Congress," received while this article was passing through the press, that Scandinavia now enforces compulsory notification of venereal disease, but am uncertain whether the action there preceded or followed the movement in Melbourne.

of five hundred and fifty, at least thirteen per cent. were syphilitic. The hospital population was superior to most hospital populations, the majority presenting themselves for minor ailments having nothing to do with syphilis.

What is more, Dr. Barrett,¹⁶ who studied the eye cases, lays down as the result of this routine testing, that it was striking how the syphilitic taint was responsible for bad after results in operation upon the eye, for lowered vitality and liability to secondary infection. If a cataract or other operation failed to heal, and became infected, he almost constantly found that the patient gave a positive Wassermann test, or a history of previous syphilis. Thirteen per cent.—one in every eight persons!

Have we any right to suppose that Edmonton, Calgary, Vancouver, Winnipeg, Toronto, or Montreal are in this respect any better than Melbourne? Surely with the knowledge that we now possess—if only with the knowledge that we as a profession possess, of the means of remedy—the time has come for us to unite in eradicating from our midst a scourge which brings in its train such hideous after-effects.

In support of my plea let me say that New York is already dealing with the matter. Upon May 1st of this year, the board of health of that city—a body which has led the municipal anti-tuberculosis campaign on this continent—put into effect a well thought out scheme along similar lines, whereby the officers in charge of all public institutions of the nature of hospitals and corrective institutions, are required to report promptly all cases of venereal disease, and all physicians are requested to afford like information regarding private patients under their care, excepting that the name and address of the patient need not be reported. All information so obtained is to be treated as absolutely confidential and not to be accessible to the public. The department of public health is prepared to make free bacteriological examination and diagnosis of material submitted when the data required for registration are furnished, and provides and distributes circulars of information in relation to these diseases.

It may be objected that all this is not a matter for dinner and after dinner conversation—that like your fashionable preacher I should have chosen for this popular address something so choice that it would offend the susceptibilities of none of my hearers, and let me add, have done no good to anybody. But I say that when a false scientific theory has been disseminated, and is being popularized and applied wrongly to the hurt of the future generations,

it is the physician's right, nay, it is his duty, to call a halt and expose the truth. When it is being taught that parents may subject themselves to intoxications and infections and that their offspring in their bodies and in their health pay no penalty, that the race does not directly suffer from the follies of individuals, that it is perfectly sound policy for this young country to welcome as citizens those of degraded or depraved parentage; then I hold that it is the duty of the physician to tell the truth as he knows it; and to explain in clear, unveiled language the basis of his belief.

I have brought forward these matters to-night, not on moral grounds, not for the soul's salvation of any here present, though I would say let him that readeth understand and apply what I have said, but because with all who have the interest of this great country at heart I want it to be realized that clean living makes the great nation; that if the parents eat sour grapes the children's teeth, ay, and much more than their teeth, are liable to be set on edge, that evil living must tell upon the race even unto the third and fourth generation.

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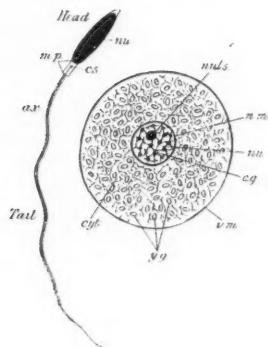


FIG. 1.—Diagram of typical Spermatozoon and Ovum, the former much more highly magnified than the latter.

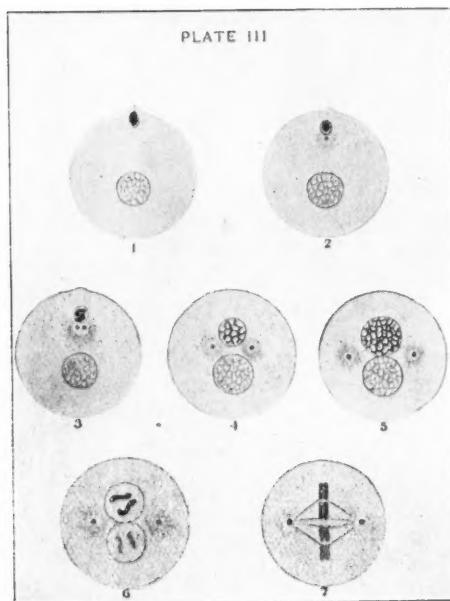
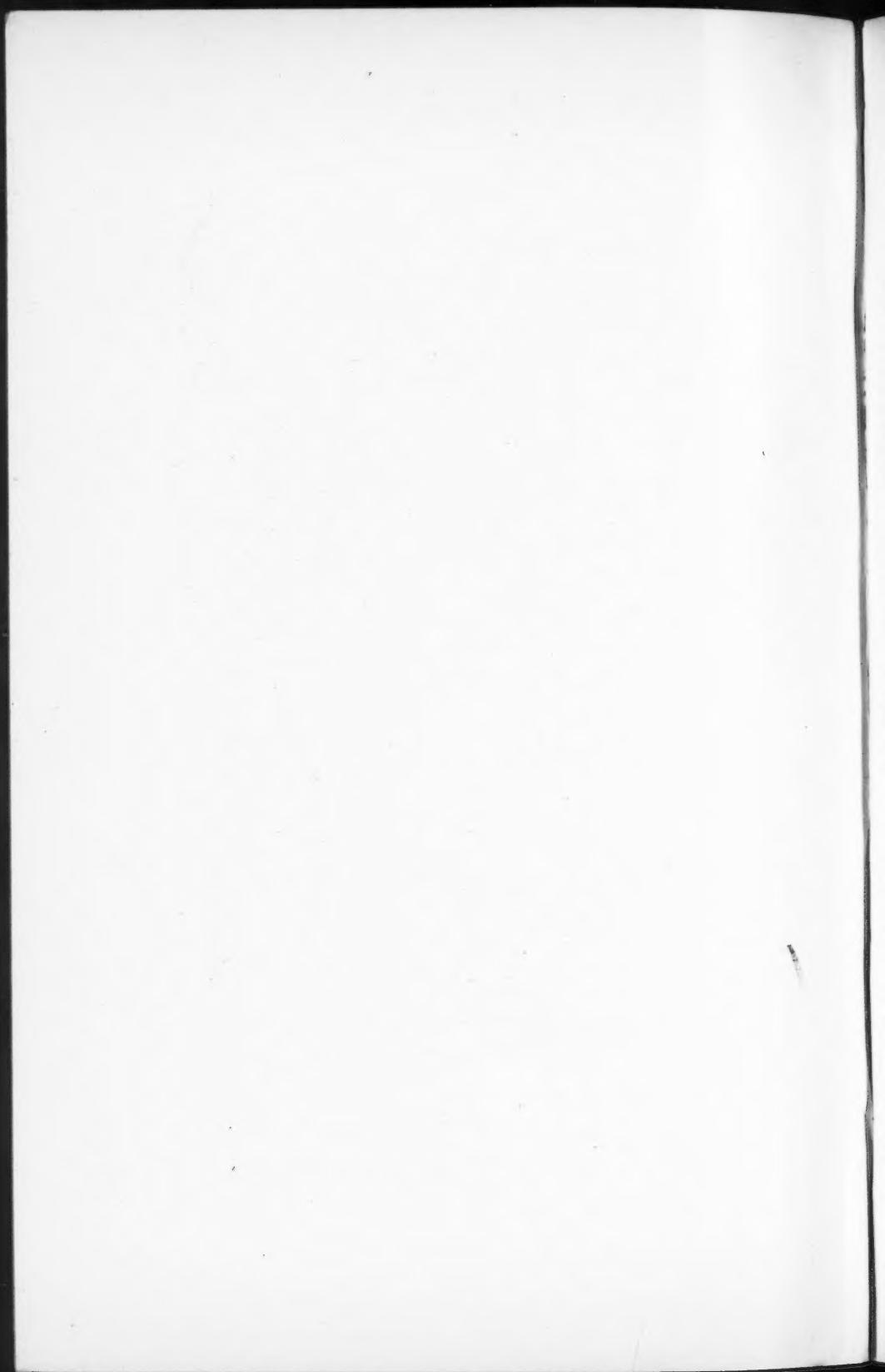


FIG. 2.—Schematic representation of the succession of events in the process of fertilisation, from the time of entrance of the spermatozoon (*sp.*) into the oocyte, until the fusion of the nuclear chromosomes of the male and female cells to form the single nucleus of the ovum.



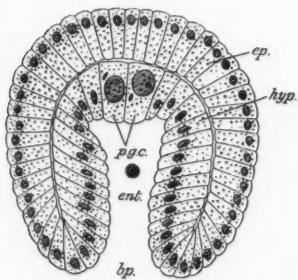


FIG. 3.—Section of the Gastrula of an Arrow Worm (*Sagitta*) showing the primordial Germ Cells. (After O. Hertwig.)

b.p., blastopore; *ent.*, enteron; *e.p.*, epiblast; *hyp.*, hypoblast; *p.g.c.* primordial germ cells.

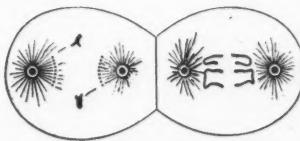


FIG. 4.—Two cells of segmenting egg of *Ascaris megalcephala*. *a*, Destined to give rise to body cells, shows diminution and casting out of some of its chromatin. *b*, The germinal blastomere shows no such reduction. (After Boveri.)

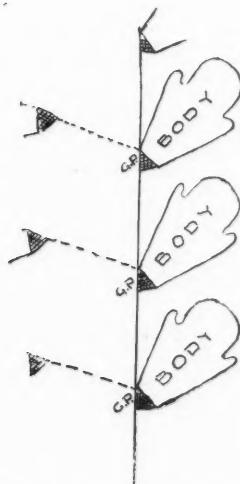
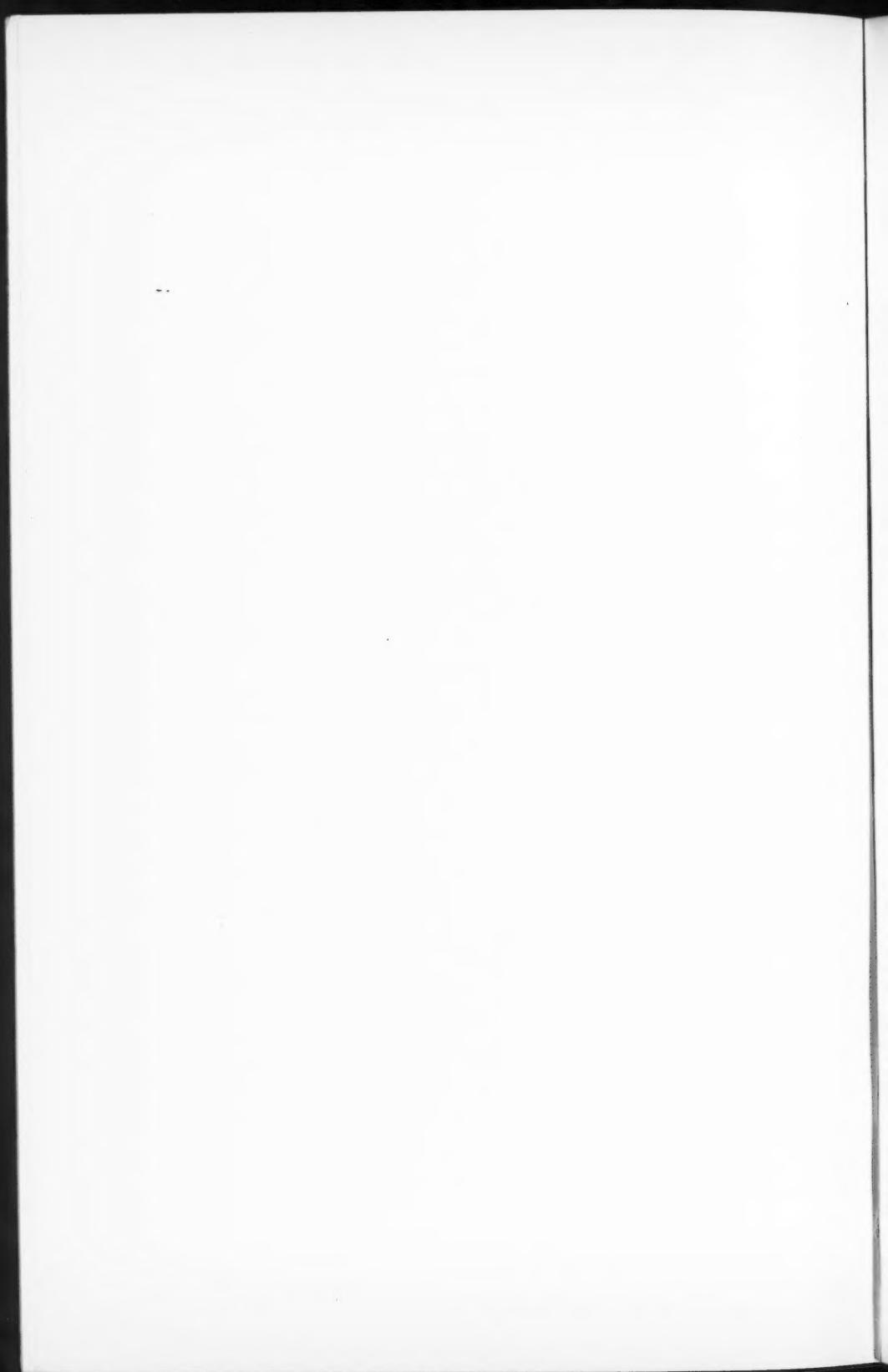


FIG. 5.—Schema of descent, illustrating the continuity of the Germ plasm, (G.P.)



DISPLACED AND MOVABLE KIDNEY IN WOMEN:
ITS SYMPTOMATOLOGY, DIAGNOSIS, AND
TREATMENT

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THE pathologic condition in women produced by displaced and movable kidney has not, in my opinion, received the attention it deserves at the hands of the medical profession. This pathologic condition of the kidney has been recognized for many years. Mesue, of Venice, in 1561, seems to have been the first to draw attention to movable kidney. The ancient writers on the mobility of this organ are Francis Pedemontanus, in 1581 and 1623, and Riolan, in 1682. ("Surg. Dis. of Kidney and Ureters," Morris, Vol. I, 1903.) Riolan was evidently the first to call attention to the importance of this condition. We find much written on the subject in modern literature, but with such divergence of opinion that the subject cannot be considered as definitely settled by any means. These two conditions give rise to a train of morbid symptoms which are not recognized as often as they should be, and a woman suffering from them is condemned to a life of greater or less suffering, unless she falls into the hands of a medical man who recognizes the condition and affords her the relief to which she is entitled, either through surgical means or by some prosthetic appliance.

In the first place, all displaced kidneys are not movable ones, and it is not necessary to be able to palpate a kidney in the pelvis, or grasp it between the fingers and move it about in the abdomen, before it will cause symptoms sufficient to make a woman more or less of a chronic invalid.

It has been the experience of many of us to be consulted by women, generally of the thin, spare type, with long waists, who complain of a dragging pain in the loin, often shooting downwards into the pelvis, with disturbed digestion, gastrointestinal flatulency, and a generally bedraggled air, who have run the gamut of their

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medical acquaintances for relief, only to be disappointed, until the true pathology was diagnosticated, and, after the kidney was properly replaced, to see all their pains and aches vanish and a great gain in weight follow the surgical or prosthetic procedure.

I have repeatedly had women tell me that their physicians advised them not to have their kidneys stitched up, as they would only prolapse again. They might as well argue against the radical cure of hernia, because some of the operated cases relapse.

The capsule. The kidneys are surrounded, first, by the fibrous capsule which adheres closely to the gland. Next, they are enveloped and supported by a capsule of connective tissue derived from the parietal layer of the extraperitoneal fascia. This capsule contains a greater or less amount of fat, and when this fat is scanty the capsule may be mistaken for peritoneum or the fascia transversalis in operations on the kidney.

According to Longyear,¹ these capsules are reënforced by still another, the perirenal fascia or Gerota's capsule. "This capsule is composed of the subperitoneal fascia which splits into two lamellæ, upon the lateral aspect of the body on either side, from which the parietal peritoneum is reflected, to pass on to and over the ascending and descending colons respectively. At this point the fascia divides into two layers, one of which passes over the front, the other over the back, of the kidney on each side. The anterior layer, after crossing over the kidney in front, is continued, and joins its fellow of the opposite side; the other, or posterior, passes behind the kidney and is continued across the psoas muscle to be inserted into the lateral aspects of the bodies of the vertebræ near their anterior surface. In that way there is formed a sac which is closed above and below, and entirely so toward the median line of the body."

The fossæ in which the kidneys lie are much shallower and wider in women than in men, hence the greater proportion of movable or displaced kidneys in the female than the male.

Frequency of occurrence. The late Byron Robinson, of Chicago, maintained that all women had palpable kidneys; that none of them were pathologic and, consequently, nephropexy was unnecessary. This, of course, was an extreme view. Other authors vary widely in their estimates. Some base their observations on post-mortem examinations; others from clinical observations.

A safe average would be from five to seven per cent. in women and two to three per cent. in men. By these percentages I mean

those patients who present themselves for examination for relief from an ailment which can be directly traceable to a movable or displaced kidney. There is no question but that a much larger proportion of people have displaced or movable kidneys, but as they cause no discomfort they are not to be considered in this connexion.

Aetiology. It is well to first settle in our minds just what constitutes a movable or displaced kidney. I cannot do better than adopt the classification of Wilson and Howell²:

1. Kidney which has merely prolapsed.

2. Kidney has prolapsed and lower pole has rotated inwards.

In these cases there is usually no expiratory upward movement on abdominal nephroleptique, but the kidney will return to the normal position on recumbency.

3. Kidney has prolapsed, lower pole rotated inwards, and has further undergone anterior displacement. There is, in this case, no tendency to return to the natural position on recumbency, but the kidney tends to become more prominent immediately beneath the anterior abdominal wall.

4. Kidney has undergone rotation only; there has been no prolapse; it lies high up, and is often not palpable without an anaesthetic.

It would seem that all the symptoms of displaced or movable kidney can be explained under this classification. Harris, of Chicago (quoted by Guiteras: *Urology*, Vol. I, 1912, p. 407), "divides the body into three zones—the upper, the middle, and the lower—by drawing three planes through the body transversely. He takes the tips of the tenth ribs as the landmarks, because they are fixed points. Finally, the distance between the upper sternal notch and the upper margin of the symphysis is taken and a line drawn between these two points upon which the length of each zone is noted. These measurements give us Harris's Index No. 1. When this index is above 77 or 78, the kidney is palpable; when below, palpation is negative."

Excluding the cases of congenitally displaced kidney and Glénard's disease, the factor most productive of displaced kidney is traumatism. This may operate through the action of a fall, a strain, by tight lacing, or by a blow or crushing injury over the lumbar region, the latter occurring most frequently in men. I have notes of two cases of displaced kidney occurring in nurses through stepping down suddenly from a high step; another occurring in a woman from being pushed from a street car and falling violently to the pavement.

It is claimed by some investigators that the lax condition of the abdominal walls following pregnancy is an important factor in the aetiology, but as the abdominal walls have nothing to do with the support of the kidney, I do not consider pregnancy as playing any part in the causation. The rôle which the abdominal muscles play is that of preserving the intra-abdominal pressure. How often do we open the abdomen through lax parietes and find the intra-abdominal pressure intact! As Carstens, of Detroit, has pointed out, the kidney is an extra-abdominal gland, and hence is not subject to the same disturbances as the intra-abdominal organs. For instance, we frequently find all of the abdominal contents in a state of ptosis, while the kidney remains in place, and *vice versa*. (Carstens, J. H., *Amer. Jour. of Surg.*, January, 1912.)

Any increase in the size and weight of the kidney must have an important bearing on its displacement downwards, such as chronic congestion, hydronephrosis, pyelonephritis, etc. Cirrhosis of the liver, chronic enlargement of the liver, from malaria and other toxæmias, are causative factors, by pressing on the kidney and tending to its displacement.

Mr. Lane has shown that adhesions may extend from the pylorus, the duodenum, and from the liver in the region of the bile ducts on to the anterior surface of the right kidney; hence, an overloaded condition of the cæcum, chronic constipation, together with a dilated and prolapsed stomach, may all contribute to the displacement of the kidney.

When we consider the shallowness and greater width of the renal fossæ in women, more especially in that type where the waist is long and narrow, and where there is usually a minimum of fatty deposit, we can easily understand how readily all the before-mentioned agencies may act in producing this pathologic condition. I do not consider stone in the kidney in this connexion, as that is in a class by itself.

Symptomatology. Usually the first symptom of movable or displaced kidney is pain. This varies from that of a dull, aching character to the agonizing pain of Dietl's crisis. According to Fenwick,³ if the kidney is movable and the pelvis somewhat distended, the patient lies on the affected side for relief; while, if the kidney with distended pelvis becomes fixed through inflammatory adhesions, the patient lies on the sound side.

If the kidney is displaced downwards, towards the pelvis, the pain often simulates appendicitis, and an operation for appendicitis has not infrequently been performed, while the offending

organ was a displaced kidney. On the other hand, if adhesions extend from the liver over the anterior surface of the right kidney, the symptoms may be mistaken for gall-bladder disease, especially when the gall ducts are encroached upon and jaundice is present.

Next come digestive disturbances. The patient may suffer from gastrointestinal flatulence due to dragging on the duodenum and hepatic flexure of the colon by adhesions, and the accompanying interference with the digestive process. These symptoms may be associated with diarrhoea, constipation, or both alternately. One may be summoned to see a patient suffering from Dietl's crisis and, on examination, a displaced rotated kidney will be found, which is much enlarged and exquisitely tender to manipulation.

Haematuria is a more or less constant symptom, and is due to back pressure on the parenchyma of the kidney from an over-distended pelvis.

Frequent gushes of urine are frequently complained of by the patient. This is brought about by an over-distended kidney pelvis emptying itself at intervals. This is one of the most constant symptoms which I have found in kidney displacement. When the ureter becomes kinked from its abnormal situation, a greater or less degree of hydronephrosis is produced, and when from over-distention the kink is straightened out, a gush of urine occurs which is sufficient to attract the patient's attention.

The ureter, owing to its being fixed by the post-nephric fascia, at first does not prolapse with the kidney, but as the descent progresses it becomes loosened from its position, and the kidney, pushing the perirenal fascia before it, together with the lengthened artery and vein, forms a false meso-nephron. This meso-nephron may be long enough to permit of the widest excursions of the kidney throughout the abdomen.

Another important factor in producing pain is where the ureter is curved over an aberrant renal artery. In some of these cases a very slight rotation or displacement of the kidney produces a ureteral kink, with its accompanying pain. In this latter type, owing to the intermittent obstruction of the ureter, hydronephrosis is most often produced. A complete and persistent obstruction of the ureter will cause kidney atrophy.

In cases of rotated kidney where there is little or no displacement downwards, the patient complains of pain in the loin of a sharp, lancinating character. These cases are hard to discover, unless placed under the influence of an anaesthetic.

Fenwick,⁴ by a series of radiographs, shows how pain and

pathologic symptoms may be produced by a very slightly displaced kidney. When the gland has a downward displacement and outward rotation of the lower pole, no kink is produced in the ureter, hence we have no symptoms. This can be understood when we consider that in many cases of downward displacement of the kidney the ureter moves with it; therefore, there is no obstruction to kidney drainage, and no pain. Where, however, there is axial rotation, or downward displacement, with rotation of the lower pole inwards, there follows ureteral kinking, obstructed drainage with back pressure, producing pain and also hollowing of the gland.

Finally, in cases of movable or displaced kidney we have a large number of patients who suffer from pronounced nervous disturbances, sometimes bordering on melancholia. Whether these nervous symptoms are caused by the kidney condition, or *vice versa*, I am not prepared to say, but will leave that to the neurologists. All I can say in this regard is that it is perfectly wonderful how these symptoms will disappear in many cases and the patient gain in weight and strength after the gland is appropriately fixed in its normal position. Suckling has reported an enormous number of neurasthenic and mental cases, which he claims were due to misplaced kidneys, and which were cured after operative replacement of the organ.

Diagnosis. We must not conclude because we have discovered a displaced or movable kidney that all the symptoms of which the patient complains are due to this condition. It is only after most exhaustive examination and the careful exclusion of all other causes that operation is to be recommended.

The method which I have found to be most efficacious in making a diagnosis is to place the patient on a short, flat table, with the feet in stirrups, and the head well supported by a fair-sized pillow. In this position the abdominal muscles are well relaxed. With the right hand—in case of the right kidney—the abdomen is carefully palpated, especially up under and below the right costal arch. If the kidney is at fault, the patient will soon complain of a tender spot. Then the left hand should be placed behind the loin and an effort made to grasp the kidney between the two hands. If it is markedly displaced, it can be easily manipulated with the fingers, and its size fairly well estimated. If only partially displaced, the portion of the kidney below the last rib may be mapped out. Very frequently on rolling the organ between the fingers of the two hands it can be felt to slip back into place with a distinct jerk.

I now have the patient put her feet down and assume the

sitting posture. Directing her to take a deep inspiration, the excursion of the kidney may be estimated. Then, still grasping and holding the kidney between the fingers, the patient is told to lie down again, when the kidney may be felt to move with great distinctness.

In case of the left side, this procedure is reversed.

The kidney may be all the more readily palpated if any degree of hydronephrosis is present.

An aberrant kidney must be differentiated from the following:

1. An empyema or hydrops of the gall-bladder.
2. Large-sized gall-stones.
3. An extra lobe of the liver (Riedel's lobe).
4. Solid or cystic tumours of the ovary.
5. An obstipation or malignant growth in the colon.
6. Appendicitis.

It is usually fairly easy to differentiate a kidney lesion from any of the above by the clinical history and careful palpation. The kidney may be replaced into its proper position; the others are usually fixed. An infected gall-bladder or supernumerary lobe is continuous with the liver dullness and cannot be pushed back.

By using Bastedo's method of inflating the colon with air, there is usually resonance in front of the kidney; in the others it is absent.

On examining the urine when the kidney is at fault, albumin, blood, and casts are frequently present; in the others absent. I had one patient, a woman, who had enormous gall-stones, forming a tumour, not only palpable but visible, and another patient, a man, in whom an exceptionally large gall-stone ulcerated its way from the gall-bladder into the hepatic flexure of the colon. In these two cases it was questionable at first whether the tumour was caused by the kidney or was in the bile passages. A minute, careful, bimanual examination soon cleared the matter up.

In another patient I operated for enlarged, displaced kidney, only to find that organ normal, while an anterior incision disclosed a dermoid of the left ovary, with a long pedicle.

In the cases where there is a long meso-nephron the patient will very often make a diagnosis herself. The kidney may be easily grasped, and its size and shape make the diagnosis unmistakable.

Occasionally a kidney will lie in the right iliac fossa, and unless care is taken it may be mistaken for appendicitis. I do not believe that a displaced kidney is ever the cause of appendicitis, but there is no reason why the two conditions may not be coincident.

Finally, in those cases of slight displacement or rotation of the kidney the method of Fenwick may be resorted to and a radiograph taken. He and others claim that the capsule of a displaced kidney is always thickened, and this causes a shadow to be outlined by the x-ray, showing the abnormal position of the gland.

In none of my cases have I met with an associated tuberculosis, pyonephrosis, or stone in the displaced kidney, but they have all been greatly enlarged and congested by interference with the blood supply.

Treatment. There are two ways open to the medical man to remedy this pathological condition: first, by prosthetic appliances, and, second, by surgical means. In thin women I have been able to apply a kidney pad, which will hold the kidney in place and relieve the symptoms. As soon as the wearing of this pad is discontinued, all the symptoms return. The great objection to the pad is that it is very uncomfortable to the patient, especially in the summer, and soon becomes burdensome. The most satisfactory treatment in this condition is purely surgical.

Short⁵ reports thirty cases treated by the following methods:

	Cases	Cured	Comp. Relief	Little or no Relief	Death
1. Transcortical suturing.....	14	9	1	4	0
2. Fixation by capsule only.....	8	3	3	1	1
3. Pure carbolic acid and gauze sling.....	8	5	1	2	0

In the transcortical suturing the sutures were passed first through the capsule, which had been stripped off, and then through the kidney substance. Secondly, the capsule was stripped off and sutured on either side to the muscles of the incision. Thirdly, the capsule was swabbed over with pure carbolic acid, the kidney replaced and supported by a gauze sling. He points out that the greater proportion of successes resulted from the carbolic acid gauze sling method.

Rest in bed and the application of heat or cold, with the administration of sedatives, are only applicable in cases of Dietl's crisis. Massage and electricity are only mentioned to be condemned, as they are nothing but a waste of time.

My experience would indicate that the ingestion of highly nutritious foods, with the object of increasing the perirenal fat, is not to be depended on, as two of my cases which relapsed both gained twenty to thirty pounds in weight, and still the kidney did not stay in place.

I am not going to review all the surgical procedures recommended for the fixation of the kidney, but will merely call attention to two.

Billington, in the *Illinois Medical Journal*, reports a large number of successes by stripping off part of the fibrous capsule and hanging it over the twelfth rib, reenforcing it by catgut sutures through the kidney.

Carstens, of Detroit,⁶ makes a vertical incision in the back at the junction of the erector spinae and quadratus lumborum muscles, and after separating them incises the fibrous capsule by a Z-shaped incision, without delivering the kidney, and stitches the cut edges of the capsule to the edges of the muscles on either side with a continuous catgut suture. He reinforces this by a broad strip of adhesive plaster extending from one side of the body to the other, diagonally, after the incision has been closed.

I have had experience in operating on twenty-five cases. Of these I have reports on fifteen. In only three of these fifteen cases had the kidney again become displaced during a period ranging from five years up to the present. One peculiar feature of the relapsed cases is that none of the distressing symptoms, such as pain, flatulence, and indigestion, which existed prior to the operation, have recurred so far. My only explanation is that at the time of the operation the kinks of the ureter were straightened out, the adhesions broken up, and in the new descent the kidney has prolapsed in a different direction.

In this connexion I would like to report a case with peculiar features. When operating on a patient for prolapsed kidney I found a very dense band extending from the kidney downwards over the ascending colon. This is what Longyear terms the "nephro-colic ligament," but which I have not found to be constant. After replacing the kidney, I thought I could better support it below by stitching the severed adhesion to the lumbar muscles. Forty-eight hours after, to my consternation, I found the patient suffering from obstruction of the bowels, this adhesion in its new position evidently constricting the lumen of the large intestine. I immediately reopened the wound, cutting the sutures holding the band; the obstruction was relieved and the patient recovered.

In this series of twenty-five cases I have only found one in which the displacement was double, the other twenty-four being on the right side. This patient was suffering from profuse haematuria, which the replacement of the right kidney relieved.

My method of operating has consisted in opening the loin by an

incision from the outer side of the erector spinae muscle, beginning at the lower margin of the twelfth rib, and extending obliquely downwards and forwards above the crest of the ilium, as far as necessary. Through this incision the kidney is delivered, examined carefully for stone, hydronephrosis, or tuberculosis, the fibrous capsule incised along the convex border, the capsule peeled back on both sides and rolled up. Three sutures of No. 3 chromicized cat-gut are first put through the transversalis fascia and the muscles on the outer side, then through the capsule, the kidney cortex, the inner roll of capsule, and, lastly, through the muscles on the inner side of the incision. One suture is placed at the lower pole, the second through the middle of the kidney, and the third through the upper pole. The kidney is then replaced and pushed up into its natural position, taking care that its normal axis is restored, and the sutures drawn comfortably tight and tied. Next, Senn's method of placing gauze below the lower pole in the space formerly occupied by the displaced kidney is resorted to, the end being brought out of the wound for drainage. The incision is then closed by long, stout, silkworm-gut sutures, and a large, copious dressing applied.

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THE need for more hospital accommodation is becoming more and more apparent in the western provinces of the Dominion. Saskatchewan, alone, a province with an area of two hundred and fifty-one thousand seven hundred square miles, received forty-four thousand immigrants last year. In this large area, with its scattered population of half a million people, there are about five hundred physicians, and there are eighteen hospitals which receive financial assistance from the government; these hospitals provide accommodation for six hundred and fifty patients.

A NEW REAGENT FOR DETECTING OCCULT BLOOD

By R. F. RUTTAN, M.D., AND R. H. M. HARDISTY, M.D.

BOAS, in 1901, was the first to call attention to the importance of the chemical reactions for occult blood and their great help in the diagnosis of obscure conditions. Before that time, one relied on the microscope or the spectroscope, or on the making of haemin crystals, all of which processes are infinitely less delicate and more difficult to carry out than the chemical tests. Nowadays the chemical testing for occult blood is a part of the routine examination in any case where stone in the kidney, duodenal ulcer, or malignant disease of the intestinal tract, is suspected. Benzidin, up to the present, has been easily the most satisfactory reagent for clinical work, but in ortho-tolidin we have a new reagent that is even more satisfactory on account of its greater delicacy, its more lasting colour, and the fact that it can be made into a solution that retains its delicacy unimpaired for three or four weeks. All this so simplifies the carrying out of the test that it might well take a place beside the familiar tests for albumin and sugar in the equipment of the busy practitioner.

The substance is Tolidin or orthotolidin—a crystalline basic body of the aromatic series with melting point 129-130°C., very slightly soluble in water, easily soluble in alcohol and æther and closely allied to toluidin and benzidin. The properties and derivatives of this base were first described by one of us in 1886.* It has never been used as a reagent for the detection of occult blood, for which purpose it is admirably adapted. It has been found to be an exceedingly delicate means of detecting the presence of blood in a watery solution, and has several important advantages over the other usual reagents when used in clinical work for the detection of blood in the excretions and secretions of the body.

To obtain some idea of its value as a clinical reagent it was tested against guaiacum, benzidin, and phenolphthalin, first of all with watery solutions of blood and then with blood in urine, faeces, and stomach contents. Its advantages in clinical use were then recognized, as it seemed to be less hindered in its action by the inhibitory substances in the body fluids than the other reagents.

* "Proceedings of British Association, 1886"—R. F. Ruttan.

I might explain briefly these chemical reactions for occult blood. They depend on the so-called peroxidase activity of the blood, and to perform the test, some substance (leuco-body), such as guaiacum, benzidin, phenolphthalin and tolidin is used that becomes coloured when oxidized, and an oxidizing agent is also used (as ozonized æther, hydrogen peroxide, etc.). These substances are placed together in a test-tube (in solution); no change takes place; a little blood is added, when the characteristic colour of the oxidized substance employed appears immediately. This is due to the ability of the blood, by virtue of its so-called peroxidase activity, to seize upon the oxygen of the oxidizing agent, and to carry it over and deliver it to the chromogenic substance—so bringing about a characteristic colour reaction, i.e., a positive reaction. Many other substances, besides blood, may give this reaction; but, when properly performed and controlled, it can only be brought about by blood—or rather by the iron-containing blood pigment.

When examining the secretions and excretions of the body, we have to take many precautions. Many substances, such as pus, mucus, and various animal and vegetable ferments, which can give a positive reaction, have to be excluded. This is done by boiling; and, further, in the case of faeces, the haemoglobin of a meat diet, which of course can give a positive reaction, has to be guarded against by dieting the patient with milk and vegetables for from thirty-six to sixty-five hours, depending on the presence or absence of diarrhoea. Or it is better still to "mark off" the stools by giving carmine. Another source of difficulty is that the secretions and excretions may contain substances that have a reducing action, that is, they are capable of seizing upon and appropriating the oxygen of the oxidizing substance, so that none is available to bring about the oxidizing of the reagent, and so a positive reaction.

In the carrying out of the tests, the reagents were made up in the following way: guaiacum was used in strength of 1-25 in methylated spirits; benzidin and tolidin in solutions of similar strength, but in glacial acetic acid. Pure phenolphthalin was prepared in the way recommended by Kastle (in *Bul. 51 of the Hyg. Dept. U.S.A.*). Considerable difficulty was experienced in making up this low reagent; extreme cleanliness had to be observed and the reagent had to be kept in a cool, dark place. Even then it lasted only some forty-eight hours in good condition.

A blood solution of known strength was used, made by taking one gm. of crystalline haemoglobin and dissolving it in a litre of

distilled water, making a solution of 1-1000, and from this solution all the other higher dilutions were made. Hydrogen peroxide was used as the oxidizing agent in all the tests, a chemically pure Merck preparation, Perhydrol, being diluted down to about a three per cent. solution—the strength of the ordinary commercial product. In testing, 1 c.c. of the reagent was used, and 1 c.c. of the substance to be tested, and, in all cases, 1 c.c. of hydrogen peroxide, except when the phenolphthalin solution was used which already contained it.

The relative delicacy of the different reagents for blood in a watery solution was first tested. It was found that guaiacum detected blood in dilutions of 1 to 50,000; benzidin, of 1 to 700,000; tolidin, of 1 to 7,000,000; phenolphthalin, of 1 to 10,000,000 and even more.

As an agent for detecting blood in watery solution phenolphthalin was found to be much the most delicate, in fact the test had to be carefully controlled to be sure the positive reaction was due to blood, for it was found that the ordinary distilled water of the laboratory gave a pinkish colour—positive reaction—due to some infinitesimal trace of iron or copper salt, and so all the distilled water had to be redistilled in glass before being used. Guaiacum and benzidin, when positive, give a prompt reaction which, however, depending on the dilution, does not last very long. With tolidin, the colour, a green to a blue black, depending on dilution, does not develop quite so rapidly, appearing more gradually and increasing in intensity, the colours lasting a much longer time, even several hours.

The delicacy of the different reagents in detecting blood in urine, faeces, and stomach contents was then compared.

BLOOD IN URINE. The 1 to 1,000 watery solution of blood, which was used before, was diluted with an equal quantity of normal (negative) urine, making a blood solution of 1 to 2,000. For the higher dilutions normal urine was added to this 1 to 2,000 solution. In this way it was found that blood in urine was detected by guaiacum and benzidin in dilutions of 1 to 6,000, the reaction of benzidin being very slightly the more marked, but still only slight and lasting only a very few minutes, while tolidin detected it in a dilution of 1 to 24,000, giving with this dilution a deep greenish-blue colour that lasted half an hour or more. Phenolphthalin, however, failed to give a positive reaction when a solution of blood in urine of 1 to 2,000 was added.

FÆCES. For the detection of blood in faeces, the stool of a

patient who had been on a meat-free diet for ten days, was used. This stool was dried and a two per cent. emulsion of it made, boiled, and one c.c. added to the different reagents, after which one c.c. of blood in watery solution was added to this mixture. The emulsion gave alone a negative reaction with all reagents, while the stool of a healthy person on full meat diet gave a strongly positive reaction even after being boiled. Testing in this way it was found that guaiacum could detect blood in dilutions of 1 to 10,000; benzidin and tolidin, of 1 to 100,000; while phenolphthalein again proved to be a very poor clinical reagent, detecting only dilutions of 1 to 2,000, and this only when additional hydrogen peroxide was added to the Kastle's reagent.

STOMACH CONTENTS. When testing for blood in stomach contents, the material withdrawn from the stomach after an ordinary test meal was used. This had a total acidity of 74, free HCl 45, and contained no lactic acid. One c.c. of this material was added to each reagent before the blood in watery solution was added. Here phenolphthalein proved to be of no value, as it is necessary for it to be in an alkaline solution and even with additional alkali it was less delicate than guaiacum. Guaiacum just detected blood in dilutions of 1 to 5,000; benzidin and tolidin in dilutions of 1 to 30,000.

To sum up, we have in orthotolidin a reagent of very great delicacy for detecting blood in watery solution, and, in addition to this, it is superior to the reagents in general use for clinical work. It is greatly superior to all the reagents for detecting blood in urine, and while benzidin, which is easily the best of the well-known reagents for clinical work, is quoted here as being equal to tolidin for the detection of blood in faeces and stomach contents, this is true only for freshly prepared solutions of benzidin, older solutions losing fifty per cent. of their delicacy in twenty-four hours, whereas tolidin will remain unchanged for from three to four weeks, an important fact, adding to the ease with which the test can be carried out. Another point in favour of tolidin is that when the blood is in small quantity, the reaction increases gradually in intensity and persists longer than with the other reagents, so being more easily read. There are, of course, many ways of increasing the delicacy of the reactions for occult blood when testing urine and faeces—such as treating with acetic acid and filtering or extracting with alcohol, ether, etc., but all these things tend to make the reaction longer and more complicated, and, where alcohol and ether are used, more expensive, so that it is a great advantage to get a reliable, delicate reagent that we can apply directly to the fluid to be tested.

FACTORS FREQUENTLY OVERLOOKED IN THE EARLY DIAGNOSIS OF PULMONARY TUBERCULOSIS

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IT may be said that surely nothing more of interest can be written upon the old subject, the early diagnosis of tuberculosis. Of such relative importance, however, do we who work in tuberculosis still hold this phase of the problem, that I desire to present the situation as it is seen from a hospital, where we admit between three and four hundred consumptives every year. Sufficient reason for selecting this subject might be found in the report made by Kendall last year, that of one hundred consecutive cases sent to the Muskoka Free Hospital in the early months of 1911, and classified as incipient by their own physicians, twenty-nine were incipient, while seventy-one were advanced, and of the latter, nine were far advanced. It appears, therefore, that certain points are insufficiently recognized in the early diagnosis of this disease. The chief of these we shall discuss in some detail with examples of individual cases.

Far too many cases are still diagnosed late. There is no necessity for early cases of pulmonary tuberculosis to go through the hands of one practitioner after another, to be finally diagnosed by a third or fourth who takes sufficient time and care to go thoroughly into the history and examination. Too often are we told by patients at the Muskoka Hospital that they had sought the advice of several doctors in succession, before the real trouble was discovered. One patient (Case No. 2088) reported to a certain physician complaining of cough and malaise. The physician prescribed a cough mixture and tonic, but failed to examine the chest. Next month the patient reported to a second physician who diagnosed tuberculosis, telling her she had had it for years. She then came to the hospital and we classified her as advanced, as the second physician had indicated. Is the procedure of the

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first physician, who did not examine his case, better or worse than that of attempting to examine the chest through the shirt? This we still hear of occasionally. The public is learning to expect thoroughness in the physician, as it has already learned to demand cleanliness in the surgeon.

I may as well make a broad statement at once, and one the significance of which is appreciated by far too few practising physicians to-day. It is not to be expected that pulmonary tuberculosis can be diagnosed in the early stages by any one simple procedure, such as the microscopic examination of the sputum, or the *cu sory* placing of the stethoscope on the chest. The chief fact, so often overlooked, is that no one sign or symptom is necessarily present.

Frequently the first factor sought is the presence of tubercle bacilli in the sputum. I believe there are those in the profession who would be farther ahead in the clinical diagnosis of this disease if we had not this cut and dried method to rely upon. These laboratory methods tend strongly to dull our wits and our senses, when they so frequently replace careful clinical investigation. The words of R. W. Phillip¹ three years ago were very plain: "If the physician waits for the appearance of the tubercle bacillus in the discharge, he waits too long. Its occurrence in the expectoration signifies a tuberculous invasion which has made considerable advance. The disease has progressed far before it takes the form of a discharging lesion. The physician's duty is to make the diagnosis prior to this." We are unable to find tubercle bacilli in the expectoration in from twenty to thirty per cent. of our cases, and these are mostly placed in wards by themselves. In this group there are always several who are in the advanced stage, and some with cavity formation.

While it may be said that a few are too ready to rely upon this laboratory method, it is also true that many use it too little, or are content with one or two negative examinations. The records of provincial laboratories show that the large majority of specimens are sent in by a comparatively small number of physicians. We have demonstrated numerous tubercle bacilli in cases where the physical signs were quite indefinite, indeed the finding of the bacilli occasionally comes as a surprise. In one instance, a patient (No. 1614) had diagnosed his own case before he went to a physician by getting his brother to examine the expectoration in the laboratory of a physician's supply house. Again, a physician who came to one of our institutions as a patient (No. 1995) with fever and malaise, had numerous bacilli in his expectoration although the chest signs were nil.

The second factor which is usually considered necessary for a diagnosis of tuberculosis is the classical symptom, cough, whereas this may not be present in early phthisis, nor indeed is it always present in the advanced stages. One of our patients (No. 2138) who had nursed her mother through tuberculosis, was advised by her physician to report the first occurrence of a cough. One year later when she complained to him of fatigue in the forenoon, he prescribed a tonic, and she was soon again able to do a full day's work without fatigue. Six months after this the patient reported a cough, and she was then sent to the sanatorium for treatment. There was active disease from apex to base of the left lung, and because of this she was classified as an advanced case. The physician waited for the cough.

There are always some patients at the sanatorium without cough. When a diagnosis is reached before this symptom has developed, the spitting of blood, fatigue, or pains in the chest are the usual symptoms which bring the patient to his physician. A nurse at the sanatorium, who is an apparent cure, came to us as a patient (No. 1456) in 1910 with symptoms of pain in the chest and langour. These were the symptoms reported to her physician. The disease was classified as Stage 1 (Turban), and there was occasional slight fever. There was no cough or expectoration.

Some writers claim that cough is not an early symptom of phthisis. Because large amounts of sputum are often tolerated over night by the lungs in tuberculous patients without coughing, and because a laryngitis is usually present in the early stages, Aufrech² argues that the early cough in this disease is laryngeal rather than pulmonary.

The third factor which is usually expected when one is looking for tuberculosis is fatigue, and yet this also may be absent in early disease. Another patient (No. 1913) reported to his physician the spitting of blood in the morning for months. He complained of no fatigue. His physician found that there was slight fever daily. He came to us with vague chest signs. Laboratory tests were corroborative of disease.

On the other hand, we have seen that no single symptom is requisite for the presence of tuberculosis, yet, on the other hand, a diagnosis may be made, tentative or positive, largely upon the presence of one or two certain symptoms. Because of this, the patient should be closely questioned regarding each of some score of symptoms, and in a carefully taken history due attention should be given to the chronological order of events. Indeed, in dealing

with a disease so insidious in its onset and so indefinite in its manifestations, the physician might well take the precaution to place his case before him in writing. By so doing he is more apt to exact definite answers from his patient in regard to both history and symptoms, and then it is often surprising how clearly the path of the slowly developing disease is recognized, and how much earlier the thread of its course can be picked up. It appears that patients are frequently not closely questioned in regard to the various symptoms, else so many cases would not be overlooked till even the patient himself feels sure of the diagnosis. Hardly a week passes at Gravenhurst without the arrival of some stranger asking that he be examined for tuberculosis. He may be convinced in his own mind that he has the disease and may assert that his own physician either could not find it or denied him the truth. Other patients, after they have been in residence for a few weeks and have learned to appreciate the insidiousness of the onset, will sometimes volunteer the statement that their physicians never questioned them in regard to certain symptoms, such, for instance, as blood spitting. One of our women patients recently stated that she believes that she has had tuberculosis since July, 1906. She says she came to this conclusion herself after coming here and learning that one could be so slightly ill and still have the disease. Her case was diagnosed in June, 1911, and the symptoms, as given in her history, indicate a period longer in duration than she herself suspects, probably from 1894 when she first came under the care of physicians.

In regard to the importance of careful inquiry for each and every symptom, let us consider a few of the symptoms individually. The one symptom that may with few exceptions be considered diagnostic is pulmonary haemorrhage. This often occurs where there is no cough, and, indeed, scores of our cases give histories of blood spitting months and years before tuberculosis was suspected. The subsequent course frequently indicates that the haemoptysis was due to an active tuberculous focus, and yet the patient is often temporarily satisfied by the physician's assurance that the blood has come from the throat. When blood comes up in the throat in small or large amount, especially if followed by blood-streaked sputum for a short period, we should not often go astray if we consider the case tuberculous until other cause is shown. A man of twenty-nine (No. 2013) consulted his physician for malaise, chilliness, feverishness, night-sweats, slight cough, and a little bloody sputum. Two months previously there was an haemoptysis of two ounces, while a year earlier he had been so frequently tired

that he had changed from indoor to outdoor work. The physician, however, treated the case for ten months before he diagnosed tuberculosis, and the application form for admission of his patient showed that he had not elicited the history of the first haemorrhage, which should have told him to treat his case as tuberculosis, even without the very definite combination of symptoms for which he was called.

A slight daily rise in temperature or an increase in the temperature range from the one degree in the normal, to the usual two degrees and more in the tuberculous, will in most cases help to make a diagnosis where tuberculosis is suspected; of course certain other causes of slight rise in temperature must be carefully excluded. A reliable temperature record cannot be obtained at the occasional visit to the physician's office, but must usually be made by the patient himself or a member of the household. Careful instruction about the details of temperature taking should be given and the temperature should be recorded four or six times daily over a period of at least a week. Exercise to produce auto-inoculation and a rise of temperature is sometimes a valuable test. Burton-Fanning³ says that where there may be a rise of a fraction of a degree in the rectal temperature after exercise lasting only fifteen minutes in the normal, there is a greater rise lasting thirty minutes in the tuberculous. In the latter case it would depend on the amount of disease and the degree of immunization already attained. This, like several others of the finer diagnostic points, requires observation over a period of time and exemplifies the fallacy of depending upon a single interview in doubtful cases.

A persistently increased pulse rate, or irritable condition of pulse, otherwise unaccounted for, may be an important factor in making the diagnosis. If the normal pulse rate for the individual is known, this observation becomes of increased value.

If we obtain the history of an ischio-rectal abscess, swollen cervical glands, pleurisies, or hip disease, etc., our suspicion is further strengthened.

A symptom which should always cause suspicion is persistent hoarseness or aphonia. A girl of twenty-three (No. 2063) reported to her physician at Christmas complaining of loss of voice. She was given a prescription without any examination of throat or chest. The prescription was repeated once by the physician and the patient was then told that further medication would be of no avail, but that her voice would return in the spring. Not being satisfied, the patient reported to another physician who immediately

examined both throat and chest and requested a specimen of the expectoration. There was no cough and only occasional phlegm, so that the specimen was obtained with difficulty. Upon microscopic examination tubercle bacilli were found, and the patient came to the hospital for treatment. Both vocal chords were thickened and there was infiltration of the interarytenoid space. Both lungs were so affected as to be classified as Stage 3 (Turban).

Possible direct exposure is, indeed, a question to be considered, and the fact of such exposure is of much greater value than the mere knowledge of a previous case in the family. The history that the patient has been boarding with careless tuberculous individuals, or working at the same desk or bench with them, certainly indicates direct exposure, and is of sufficient value to be reckoned among the diagnostic points. The knowledge which the patient may have obtained of previous consumptives having occupied his house or room, if definite, is also extremely suggestive.

That everyday complaint, fatigue, might well be weighed and balanced against existing conditions in a patient's life and work, more frequently than is done, instead of prescribing tonics as a routine, as in the case already mentioned.

The cough, or the slight raising of phlegm, that is usually described as taking place "only in the mornings," is suggestive, and always warrants investigation. When we recall the use of the ciliated epithelium of the trachea and bronchi, we can appreciate how phlegm may be raised without cough and expectorated by a mere clearing of the throat. It is a very common point in the history of the onset of pulmonary phthisis that clearing of the throat has occurred in the mornings for months.

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In dealing with the points most frequently overlooked in the study of a case of possible tuberculosis, we have considered the history and clinical symptoms before the physical signs, for two reasons. First, although a patient may report a definite combination of symptoms of tuberculosis, the physician too often waits for the appearance of very definite physical signs. Secondly, it appears that a true appreciation of the relative values and significance of the various chest signs is not obtained either in our college courses or in general practice. Therefore, the practitioner may more safely reach an early diagnosis from a carefully taken history, with full weight given to apparently trifling symptoms, than by the results of his examination at a time when physical signs may be both indefinite and misleading.

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We may now turn to the consideration of chest signs. As was said of symptoms, no one is necessarily present. Perhaps the sign most frequently sought when looking for tuberculosis is that of râles, and yet in the early stages these may be very difficult or impossible to detect. Even in the moderately advanced stages, râles are sometimes difficult to hear. When this sign is absent or concealed in any individual case, points for consideration are, whether or not it may be due to the type of breathing, the character of the secretion, the site of the lesion, pleural thickening, or the thickness of the chest wall. The fact remains that in a very fair proportion of early cases, râles cannot be detected by the technique in general use, while in a smaller proportion of cases, râles cannot be elicited by any known method. Indeed, auscultation will also, occasionally, reveal nothing abnormal in the character of the breath sounds.

The second sign which is often sought in vain, is an abnormal percussion note. I think of the two methods of physical examination, auscultation and percussion, the latter is frequently more difficult. It may be that the normal resonance of the individual chest is sometimes more difficult to gauge than the normal vesicular murmur. It does appear that one is more often at sea in attempting to classify or value the exact results of percussion than those of auscultation. There may also be definite and moderately advanced pulmonary tuberculosis without any demonstrable abnormality in the percussion note, depending on the site and type of the lesion or the presence of compensatory emphysema. Deformity of the chest wall independent of the lungs may also materially modify the percussion note.

Inspection of the chest for possible retraction, deformity, or emaciation, may reveal no visible sign of disease in early or even moderately advanced phthisis.

Against the statement that in certain early cases neither auscultation, percussion, nor inspection may reveal definite signs of disease, we must place the claim that any one of these three methods of examination, provided that careful technique is employed, may in other obscure cases demonstrate such abnormal variation that it becomes the deciding factor in the diagnosis. First, consider again the elicitation of those "sounds which are produced within the lung by respiration, and which are wholly additional to the natural or morbid breath sound," namely, râles. These adventitious sounds, more especially when persistent and heard in the apices or upper parts of the lung, are so often diagnostic that we may

well take time to consider special points in the technique of examination for them.

The auscultation of the chest for râles requires much greater care and precision in routine than is usually given to this part of the chest examination. After auscultation during normal breathing, the patient is requested to breathe deeply, but not too forcibly. The object is to procure sufficiently full respiratory excursions that all intrapulmonary adventitious sounds may be brought out, without the possibility of fine crepitant râles being obscured by too forceful an effort. I have found that the average rate most satisfactory in auscultation for râles is ten to twelve respiratory excursions to the minute. If good full respirations are not taken when first requested, it is our custom to proceed at once to direct, in a whisper, each inspiration and expiration. It is frequently found that the patient does not comprehend what is meant by taking a deep breath,—extra inspiratory effort. It is more often found that he does not appreciate extra expiratory effort, that is, the expelling of more residual air, and this, I believe, is as important as the former. After finding no râles during ordinary deep inspirations, one can sometimes elicit them over a whole lobe by exacting an extra respiratory effort prior to each deep breath. This is why the cough is so often of value. It is to the same purpose. If a long expiration is accelerated, the result at the end is a cough. A cough at the proper time serves the same purpose, then, as an extra expiratory effort, and as such will frequently bring out râles which would otherwise go undetected. A chest examination without having the patient cough and then breathe deeply, can hardly be called complete.

In the auscultation for slight variations in the breath sounds, we are likely to note the earliest changes produced by disease. It appears that the stage preceding that of râles can sometimes be detected by slight changes in the respiratory murmur, more especially in the detection of a granular, impure, or slightly roughened inspiration. This type of breath change can be most easily appreciated by close comparisons between the auscultated breath sounds in the normal, and again in the chest with the first appearance of râles. This is a stage between the two. Feeble breathing is said by some to precede granular breathing. I have not been able to demonstrate this so frequently, and have relied rather upon the granular type as the earliest change.

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The percussion change as a diagnostic factor may not be evident

as early as auscultatory change, but it usually follows very closely, and its detection is more or less corroborative. It may, in fact, be noticed before any other physical sign, if for no other reasons than that the ear may be quicker to note it, and that the sensation of touch also comes into play. Impairment of resonance may sometimes be the most marked physical sign, indeed occasionally it is the only one demonstrable. If from the symptoms one strongly suspects tuberculosis, slight impairment of resonance in an apex may be corroborative. Slight hyper-resonance is frequently found in an area adjoining the suspected part, or on the opposite side. Light percussion has been advocated by many authorities as giving the best results, and this, I believe, is not given a fair trial by most physicians. We overlook the fact that the lighter the stroke the more accurate are the findings for the exact area examined. In certain areas of the chest, I often find the simple tapping with one finger the most satisfactory method of percussion. In this it seems easier to obtain a light stroke, and the area examined is more limited than when a pleximeter is used. It is often found on percussion or palpation of the chest that certain areas give pressure pain where there is pathological change in the lung or pleura. Francke found this symptom present in eighty-one per cent. of early cases.

No one thing is more important in early cases than inspection. The careful inspection of the chest, having the patient sit straight in front of the examiner, with shoulders well back, and hands by the side, will in many early cases show a unilateral apical retraction which fits well into a chain of diagnostic points. Where retraction in the apices is bilateral, it is not so diagnostic, and yet bilateral disease may thus be easily overlooked. The limited expansion of apex or base, or any one part, noted on inspection alone or aided by palpation, will often locate the lesion at once. Of course, changes in the contour of the chest, as in the percussion note, may indicate past as well as recent disease, and for this reason are secondary to the finding of adventitious sounds on auscultation.

A concrete example of an early diagnosis, depending on a few of the factors enumerated above, might be of interest here. A young woman came to the hospital last year on a visit, and incidentally asked for an examination, declaring at the same time, that she had no symptoms. The examining physician on inspection noted slight right apical retraction, and on auscultation over the same area, an inspiratory murmur slightly roughened, usually called granular or impure breathing. These were the only signs.

The examiner was about to postpone a definite opinion until a later visit to the hospital, but proceeded to ask the patient concerning particular symptoms. On close questioning it was found that she had spit phlegm streaked with blood two months previously, and there was some fatigue at the same time, but this was attributed to the hot weather. The patient had reported these two slight symptoms to her physician, who had prescribed tonics and rest. This bit of history, elicited with difficulty, decided the case for the examiner, and the patient came into residence next week for treatment (No. 1976). Later examinations by other physicians and laboratory tests, proved the presence of clinical tuberculosis. This patient had never coughed, had lost no weight, and claimed to feel quite well at the time of examination.

We have seen that not infrequently pulmonary tuberculosis may be present in an incipient or moderately advanced stage, and yet the physical signs may be so concealed that they may be difficult or even impossible to detect. I consider this type of case to be the most deceptive to the practitioner. So often have we had the opportunity of examining and observing cases soon after diagnosis, and of comparing our results made under the favourable advantages of a hospital, with the findings of their physicians recorded on the application forms, that we conclude such a type is not generally recognized. It would seem advisable then to refer to cases of this type as a definite class of obscure tuberculosis. This type has been recently described by Neuman.⁴ Many examples of the type with secretly written (cryptographic) signs could be cited from our charts; they would but exemplify and bear out what has been claimed in paragraphs above, namely, that physical signs are not necessarily present, and that in doubtful cases we are warranted in depending for diagnosis more upon symptoms than chest signs.

We are quite aware that it is said of us who have worked in tuberculosis wholly, that we find it "whether or no." It must be stated emphatically, however, that those of us who train specially in this disease, get safely over any anxiety to make a positive diagnosis of tuberculosis before we have been studying the disease many months. We have, on rare occasions, I admit, declared no definite evidence of clinical tuberculosis in patients referred to us for investigation, and have sent them back to their physicians.

Finally, we must not overlook the hypothesis of universal infection which is now generally accepted by scientific observers. This phase of the problem has been reviewed recently by Caulfeild,⁵ and also by Parfitt.⁶ Admitting that all adults have received at

some time an inoculation of tubercle, it is not surprising that in our initial chest examination at the Muskoka Hospital we frequently locate the site of a primary infection aside from that of the active lesion. The active lesion is thus, usually, the result of a subsequent infection or of an auto-reinfection. In fact, in going over clinical normals, we cannot often declare an absolutely clear chest. The diagnosis required in practice is, of course, the presence or absence of clinical tuberculosis, and whether or not special treatment is required.

The attempt in this paper has been to bring to greater notice the factors for the early diagnosis of pulmonary tuberculosis most frequently overlooked, and to present a clearer picture of this most variegated symptom-complex in its incipiency. I also hope that I have made plain the cardinal rule, that no one sign or symptom is requisite to the presence of phthisis, and that "a diagnosis of pulmonary tuberculosis from one single physical sign," or indeed from one single symptom, "should never be made" (Price).⁷

The responsibility of recognizing tuberculosis in its incipiency must always rest with the general practitioner, and the facilities at his hand for thorough supervision of his cases can seldom be compared to those of a hospital or dispensary. Let us hope that the dispensary for investigation of suspected cases, and the closer study of clinical pulmonary tuberculosis, will soon be available for the many rather than for the few.

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5. CAULFEILD, *Can. Med. Assoc. Jour.*, Vol. ii, No. 6, 1912, p. 461.
6. PARFITT, *Can. Med. Assoc. Jour.*, Vol. ii, No. 6, 1912, p. 477.
7. PRICE, *Brit. Med. Journal*, Vol. i, 1912, p. 287.

A FURTHER CONTRIBUTION TO THE STUDY OF SCOLIOSIS

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IN studying those forms of scoliosis in which the affection is a bone and not a muscle problem, above all things it is necessary to have a clear conception of the pathology of scoliosis and to accept the statement, as already proved, that there are two distinct forms of scoliosis. First, there is postural or physiological scoliosis; second, there is organic scoliosis. The first may, in all cases, be a precursor to the second. This is open to question.

1. POSTURAL OR PHYSIOLOGICAL SCOLIOSIS. This, whilst simulating pathological scoliosis, is dependent upon attitude. It results from the assumption of certain attitudes, but when the model is released from these attitudes the physiological scoliosis disappears.

2. PATHOLOGICAL SCOLIOSIS. This seems to be an exaggeration of physiological scoliosis. In it the formation of the corporal parieties is organically changed. Here we have fixed deformities, which are not directly due to attitude.

PATHOLOGY. The deformities are of the trunk, and especially of the thorax. All the component parts of the thoracic parieties enter into the deformity as a whole, but the characters of the deformities of each lateral thoracic wall are diametrically opposed to one another.

The deformities of scoliosis include a lateral deviation of the spine. This is but one of a series of deformities. It is questionable whether it is not a secondary deformity and unlikely to be of as great importance as the deformity of the rib walls already mentioned.

Scoliosis, then, is not a deformity of the spine alone, as it seems to have been so frequently considered. It is a deformity of the trunk as a whole, but especially of the thorax.

DEFORMITIES OF THE THORAX. In the graver forms there is a

Read at the Montreal Medico-Chirurgical Society, November 1st, 1912.

posterior prominence and a lateral descent of the ribs. This is usually of the right ribs. The rib wall seems to have been crushed in towards the spinal column. It is flattened. The posterior convexity is sharp and razor-like. On the opposite side the ribs are deep and hollow behind, but, as a rule, prominent in front.

DEFORMITIES OF THE SPINAL COLUMN. The spinal column is curved usually in the dorsal region. The curve is convex towards the side on which the ribs are prominent. (In this, organic scoliosis differs, at least apparently, from a postural or physiological scoliosis, where the curve is concave towards the side on which the ribs are prominent.) There are compensatory curves, usually in the cervical and lumbar regions—perhaps also in the dorsal region. These compensatory curves are in obedience only to the laws of gravity.

CONSIDERATION OF THE DEFORMITY IN RELATION TO TREATMENT. The two sides of the thoracic wall in this affection are deformed. There is a flattening on one side posteriorly. There is a bulging on the other side anteriorly. The rational treatment will aim at reversing this. When this is done the law of Wolff¹ must be depended upon to confirm the correction. To be more lucid: If it were possible to change the two sides of the deformed thorax, the one for the other, we would have what might be called scoliosis on the converse side. It is impossible to change the two thoracic walls the one for the other, but it is possible to obtain scoliosis on the converse side. This is done by obtaining, by posture, physiological scoliosis on the reverse side to that of the greatest apparent deformity.

TREATMENT. Scoliosis on the side converse to the greatest deformity is what is aimed at. This may be obtained by posture. It may be obtained by either lateralization or rotation (Fig. 1 and 2). Perhaps it may be obtained by either equally well. The physiological scoliosis so obtained may be maintained by the use of a plaster of Paris jacket. Because this physiological scoliosis places the thorax in the position farthest removed from the position of deformity, it is the position to be preferred in the treatment of organic scoliosis.

Physiological scoliosis induced by rotation is easier borne by the patient than is that induced by lateralization. It is a position

¹ **WOLFF'S LAW.** Professor Julius Wolff, of Berlin, announced the following law, which has since borne his name. "Every change in the form and function of the bones, or of their function alone, is followed by certain definite changes in their internal architecture, and equally definite secondary alteration of their external formation in accordance with mathematical laws."

borne without pain. It is an attitude which is not unsightly, and it may be unconsciously compensated for by the patient.

The plaster of Paris jacket applied to maintain the correction in this form of treatment is fenestrated to encourage growth in those parts of the chest wall which are flattened. This makes it reasonably light. It is applied in two parts. First, a pelvic girdle is made and allowed to harden. On this as a foundation, but only after the thorax has been rotated on the pelvis, the second or upper part is applied by means of the apparatus already suggested by the writer¹ and to be more fully described by his associate, Mr. H. E. MacDermot, in the *Journal of the American Orthopaedic Association*. Plaster jackets so applied efficiently maintain correction. After they have been employed for a reasonable time, gymnastic exercises may be employed to confirm the correction maintained in them. During their employment breathing exercises may be used to expand the contracted parieties.

¹ *New York Medical Journal*, July 6th, 1912.

MEDICAL EXPLANATION OF AN APOCRYPHAL MIRACLE. An editorial in the issue of the *Lancet* for March 9th calls attention to a case, recently reported in a Danish medical journal, of a man, blind in one eye from cataract, whose sight was suddenly restored one day after he had rubbed the eye vigorously on account of some sweat that had run into it. Examination showed that he had dislocated the cataractous lens, which had dropped to the bottom of the eye, where it lay floating in the vitreous. It is suggested that a similar occurrence may have occurred in the miraculous cure of Tobit's blindness, as recounted in the Apocrypha. By direction of an angel, Tobias, his son, took the gall of a fish and "strake of the gall on his father's eyes. And when his eyes began to smart, he rubbed them; and the whiteness pulled away from the corners of his eyes: and when he saw his son, he fell upon his neck and wept." It had been suggested by Professor Greef, in commenting on Rembrandt's famous painting of this scene, that Tobit's affection was bilateral pterygium.

Boston Medical and Surgical Journal, March 28th, 1912.

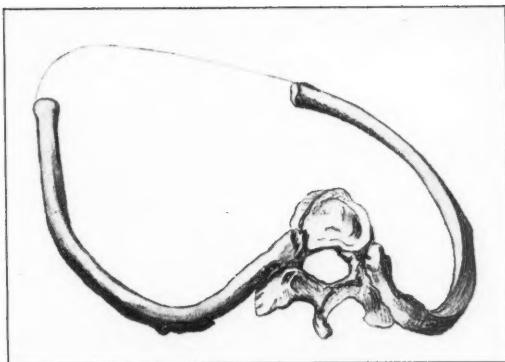


FIG. 1.—From Feiss. Demonstrates the deformity of scoliosis.

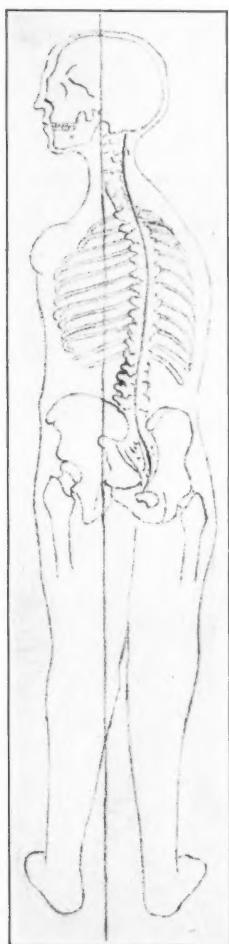


FIG. 2.—From Feiss. Demonstrates the position of the thoracic parietes in rotation. It demonstrates the similarity of the parietes in either rotation or lateralization, and, lastly, the similarity between physiological and pathological scoliosis.

Editorial

MEDICINE IN IRELAND

AMONGST the many beneficent results arising from the celebration of the two hundredth anniversary of the foundation of the Trinity College Medical School at Dublin, is a book by Dr. Kirkpatrick, entitled, "History of the Medical Teaching in Trinity College, Dublin, and of the School of Physics in Ireland." The record of these two hundred years is really a history of medicine, not only in Ireland, but in the world at large. But especial interest attaches to the book inasmuch as it gives, by way of introduction, a most succinct account of the history of early medicine in Ireland. It appears that the Irish, like the Greeks, had their medical deity, who, in this case, was known as Diancecht, or the possessor of "the eminent power," and a date as early as 1272 B.C. is assigned to him. The next medical hero of note was "Eaba" the female physician. Shortly before the opening of the Christian era, there is a record of the activities of Fingen which is contained in the "Book of Leinster," and is still to be seen in the library of Trinity College. Fingen appears to have practised a conservative surgery. By the fumes which arose from a house, the number of patients therein and every disease that prevailed, was known to him. The king was wounded in the head by a stone missile, but the surgeon declined to remove the foreign body. He left it *in situ* and stitched up the wound. The patient survived for seven years, and he was recommended not to allow his anger to come upon him, that he should not go upon a horse, and that he should not run. There is a well defined tradition that the ninth king of Scotland was sent by his parents to Ireland to be educated amongst the physicians there.

Nor were the Irish left without a well defined code of medical jurisprudence. In the "Senchus Mor" the rules are clearly set forth under which a patient might recover damages from a physician for "bad curing," and there is a distinction between lawful and unlawful physicians. This precaution against malpraxis was common to all ancient jurisprudence; indeed, the Babylonian code of Hammurabi, which dates back to 2200 B.C., lays down the rule that "if a physician has treated a patient for severe wound with a lancet of bronze, and has caused him to die, or has opened an abscess of the eye, and caused loss of sight, he shall have both his hands cut off."

In Ireland if one person wounded another the aggressor had to pay a fine to his victim and provide him with sick maintenance and medical care; even the accommodation exacted was clearly specified. The patient must have a room with four doors in it, and water must run across the middle of the floor. Precautions were to be taken that a sick man "should not be injured by women or dogs;" that "fools and female scolds" should not be allowed near him; and that he should not be injured by forbidden food. Physicians were compelled to build their houses over a running stream, and in time the house of a physician came to be regarded as a hospital.

Amongst the Irish, as amongst the Greeks, the medical calling was hereditary, and this practice has prevailed until comparatively recent times. Some of these medical families were the O'Callenans, of Desmond; the O'Cassidys, the O'Lees, and the O'Hickeys. Indeed, it is on record that Nicholas Hykie was the medical health officer of Dublin in the year 1590. His scale of fees was prescribed and he was expected to remain within the precincts of the city.

It does not appear from Dr. Kirkpatrick's researches how these old physicians acquired a knowledge of their profession, but probably it was done by a system of apprenticeship. There is evidence, however, that many Irishmen

studied abroad, and in the Middle Ages medicine was often studied in the monasteries as part of a liberal education. Manuscripts are yet in existence containing translations of the writings of the Arabian physicians, of Hippocrates, Aristotle, and Galen, which would seem to indicate that the Irish physicians were conversant with the best medical knowledge then current in Europe.

HEALTH AND EDUCATION

THE first open-air school held under the auspices of the Toronto Health Department closed its three months' session on September 14th last. The experiment has proved in every way a success, and in one family alone five cases of tuberculosis were arrested, and possibly prevented altogether. In his account of the session, Dr. Struthers, the chief medical inspector for Toronto, stated that the average child, during the first week, gained from one-half to four and one-half pounds. And not only did the children show great physical improvement, but their mental faculties were awakened, and the dull and listless air gave place to an eager desire to learn and an intelligent interest in their surroundings.

The open-air school has been in vogue in the United States for some time, the first school having been established in 1908 in Providence, R.I. The results have been so satisfactory that over thirty schools since then have been inaugurated, and Canada cannot do better than follow the example. There are many children who are not physically strong enough to attend the ordinary schools and to keep pace with their companions: the problem is what should be done with these children. If they are excused from attendance at school there is nowhere for them to go; and, in all probability, their homes are the worst places for them. The open-air school seems to be the solution. The movement has been commended in Toronto and in Hamilton, and, one feels confident, will very soon bear fruit in other parts of the Dominion.

The Royal Edward Institute has already decided to establish an open-air school for tubercular children at Montreal, and an executive committee has been named consisting of Dr. Roddick, Dr. Guerin, and Mr. Farquhar Robertson. At present there are eighty-six children attending the institute, and it is proposed to select twenty-five of these children to form an open-air class in the hope of effecting a permanent cure for each individual child.

The children of to-day are the citizens of to-morrow, and their proper development is a matter of national concern. Many need help to overcome their physical imperfections, and many more require assistance in their mental development. It is, unfortunately, only too probable that children whose mental defects are pathological can achieve little or no improvement, and these should be provided for in institutions and separated from their normal companions. But there are many children who are defective in mental capacity who, with judicious treatment, can be educated to earn their own living and who, otherwise, would grow up to be a burden on the state. At the meeting of the Canadian Public Health Association in Toronto, Sir George Newman, the chief medical inspector of schools in Great Britain, stated that it has been found by experience that forty-five per cent. of the children of feeble-mind can be educated to earn part or all of their own living. When one remembers that there are six thousand feeble-minded persons in Ontario alone, the mental development of the child becomes a serious question.

THE MEDICAL INSPECTION OF IMMIGRANTS

If in the years to come Canada is to hold its own among the nations, it must neglect no opportunity by which the health of the coming generations may be secured. Not only must measures be enforced to conserve the health of citizens and to prevent the spread of disease, but more atten-

tion must be paid to those coming to this country, and none should be allowed to enter the Dominion save those who are physically fit to become good and useful citizens.

Although a systematic medical inspection of immigrants has been conducted at all Canadian ports for the past nine years, the hospital records still show a very large proportion of immigrant patients. While the capable, self-supporting immigrant is an asset and should be encouraged to come to Canada, the undesirable immigrant merely constitutes an increased expenditure and an addition to that dependent class of citizen which should have no place in a new—or indeed in any—country. During the past nine years, four thousand six hundred and sixty-seven immigrants have been deported from Canada. The principal causes of deportation have been: general debility and public charge, that is, persons unable to support themselves and liable to become a charge on the community, two thousand three hundred and forty-one; vagrancy and criminality, six hundred and seventy-six; mental weakness or insanity, six hundred and thirty-seven; and tuberculosis, one hundred and sixty-nine. During the year beginning April 1st, 1910, and ending March 31st, 1911, seventeen thousand eight hundred and sixteen persons were refused permission to land in Canada, and seven hundred and eighty-four persons were deported. These numbers are not large when considered in relation to the number of immigrants who arrived in Canada during the year, one hundred and eighty nine thousand six hundred and thirty-three entering by the various ports, and one hundred and twenty-one thousand four hundred and fifty coming across the border from the United States. But, while one does not forget the work accomplished by the Department of Immigration in Great Britain and in other European countries, the question still arises, would it not have been possible to prevent the greater number at least of these undesirables from embarking for Canada? Arrangements have recently been made with the steamship companies by which most of those persons who are considered physically

or morally unfit to be permitted to land in Canada, shall be taken back to the port of embarkation and provided with a ticket to their inland destination. As this implies considerable expense to the steamship companies, the inference is that persons desirous of sailing as emigrants will be subjected to a stricter examination on the part of steamship lines.

Much has been done by the provincial governments to dispel the ignorance of Canadian conditions by the distribution, in the various European countries, of literature containing information for those desirous of emigrating to this country. Thus, a knowledge of the regulations of the Canadian Immigration Act, and of the climatic and other conditions of the country, may be obtained. The difficulty is, of course, that so many do not avail themselves of this opportunity; and in spite of all that has been done, as is proved by the figures already given, many continue to come who are unfit to make good citizens and who, sooner or later, drift into hospital to swell the already large numbers there. However, conditions have much improved, and we hope they will continue to improve until each immigrant is at least physically worthy of the expectation expressed by the Minister of the Interior when he said that "Canada expects nothing from an immigrant except that he should succeed."

DR. WILLIAM BEAUMONT

IF Dr. William Beaumont was not a Canadian, at least his patient Alexis Bidigan, *dit* St. Martin was; and in some way much of the credit for the joint experiments upon digestion which were carried on by these two observers has been imputed to this country. Dr. Jesse S. Myer has just published, through the Mosby Company, the "Life and Letters of Dr. William Beaumont," but he has also given us the life and letters of Alexis St. Martin as well. The best biographies have been the fullest, and the researches of Dr. Myer leave nothing

more to be desired. The introduction is done by Sir William Osler, and properly so, for at the time of St. Martin's death in 1880, in the eighty-third year of his age, when Dr. Osler was a resident of Montreal, he offered the courtesy of his services to perform an autopsy, and even suggested the purchase of the famous stomach for preservation in a museum. But the family was obdurate. They postponed burial until decomposition had made the body safe against the anatomists, and they buried it under eight feet of earth.

The most precious statement in the book is this: "I took him into my own family in April, 1823, at a time when he was helpless, sick, and suffering under the debilitating effects of his wounds, naked and destitute of everything but pain, a little 'breath of life,' and a wounded body. In this condition he remained with me, gradually improving, for a year or two, when he became able to walk about and help himself a little, but unable to provide for his own necessities. During this time I nursed him, fed him, clothed him, lodged him, and furnished him with every comfort, and dressed his wounds daily and for the most part twice a day." Dr. Beaumont made every effort to close the wound, and it was not until after he had cared for the boy for two years at his own expense, at a time too when his pay as army surgeon was only forty dollars a month, that it occurred to him to utilize the case for experimental purposes.

And St. Martin was not entirely tractable. He displayed a certain amount of interest in his own case. He allowed himself to be fed by a novel method, but he was resolute to the end that his whisky should be administered *per vias naturales*. He would leave his employer on the least, or no, provocation, and proceed to his home near Berthier, where he afterwards had a wife and five children living. There are sixty letters extant from Dr. Beaumont soliciting and commanding his return. The first report of Dr. Beaumont's experiments upon digestion was published in the *Medical Recorder* in 1825, Vol. VIII, No. 1, p. 14, but it bore the name

of Surgeon-general Lowell to whom it had been sent by the author. This error, however, was corrected in a later issue.

However fine was his charity, Dr. Beaumont was a man of prompt and vehement speech. "Were I," he wrote, "reduced to the necessity of existing upon the charity of this borough I would commit suicide without scruple or hesitation." He published in a newspaper that his partner in practice had availed himself "of a treacherous memory to sacrifice his integrity." He offered to fight a duel with a fellow-officer who declined and afterwards aggravated his original offence. Dr. Beaumont then published him to the world as "a contemptible liar, a base villain, and a poltroon." Finally, he resigned from the army after a most acrimonious correspondence with his superiors. The picture which is given in the "Life and Letters" of Beaumont's domestic life is charming. There are letters to his father full of filial piety, to his wife, letters suffused with affection. His scientific method was most rigid, his observation keen, and his records unbiased by pre-judgement. It is fitting that this book should proceed from St. Louis where the subject of it spent so many years and where he lies buried.

THE two existing medical societies in Winnipeg are looking forward to amalgamation under a new name. It is felt by many members of both societies that a complete reorganization will result in even better work being done.

"THE early diagnosis of pulmonary tuberculosis" was the subject chosen by Dr. W. M. Hart in his address to the Saskatchewan Medical Association. The paper was an extremely interesting one and emphasized many points of value to the practitioner in the early diagnosis and treatment of tuberculosis. It was unanimously resolved that the paper should be printed and a copy sent to each member of the association.

THE Grace Hospital at Toronto was severely censured in consequence of the death of Robert Scott, an insane patient who was killed through jumping from a balcony sixty feet high at the hospital. The coroner's jury recommended that the government grant should be withheld from the hospital until a suitable building is erected to replace the present structure. The hospital staff was exonerated from any blame in the matter. It appears that the building has been condemned by Dr. Bruce Smith, the inspector of hospitals and public charities, and the hope was expressed that an effort would be made to provide a modern hospital building without further delay.

AN unfortunate incident has occurred at the Victoria Hospital at Prince Albert, Saskatchewan. On September 17th, last, the matron and the entire staff of nurses gave in their resignations to the board of governors. Their action is the result of charges which are alleged to have been made against their characters by one of the members of the city council, Mr. T. E. Baker, and by certain patients against the management of the hospital. An investigation of the charges of mismanagement was made by the committee and, with one exception, they were found to be groundless. As to the charges against the character of the nurses, these were denied by Alderman Baker. However, the resignations of the matron and staff, including the orderlies, have been accepted by the directors.

THE burden of caring for the feeble-minded is becoming greater as the years go by. During the past year it has been impossible for the hospital authorities at Orillia and Woodstock, in Ontario, to receive all the applicants for admission to these hospitals. The Orillia hospital alone has three hundred and eleven applications on file, and there are sixty-nine more patients in the hospital than the building can conveniently accommodate. The greater number of these pa-

tients are Canadian born. Of the one hundred and twenty-five patients admitted to the two hospitals during the past year, ninety-four were born in Canada; and of the two thousand five hundred and seventy patients who have been admitted since these hospitals were founded, two thousand one hundred and eleven were born in this country. In many instances, several members of the same family are undergoing treatment, and from the records of these and kindred institutions, heredity appears as a very frequent cause of weak mentality.

THERE is some justification for the belief that medical periodicals are sufficiently numerous, as well in Canada as elsewhere. But even to one who holds such views the latest addition to Canadian journals will be welcome, adding, as it does, more in quality than in quantity. The *University of Toronto Medical Bulletin*, in its first number recently issued, attains a high standard of excellence. It is described as a "Publication devoted to clinical and laboratory work carried on by members of the University of Toronto medical staff, in the city hospitals." To keep the graduates in touch with this work is one of the principal objects of the *Bulletin*; but one may hope that before long it may make a wider appeal, for with the excellent medical facilities enjoyed by Toronto, there is here an unusual opportunity of developing a periodical of recognized scientific importance.

The first number consists of twelve original contributions, all of interest and well presented. An interesting case of acromegaly is fully reported by Drs. Chambers, Bruce, and Mackenzie; unusual complications of typhoid are reported by Dr. Rudolf, and by Drs. Chambers and Cole. Other contributors include Drs. McVicar, Bates, Strathy, Thistle, Howland, Malloch, Primrose, Gallie, Stanley Ryerson, and G. W. Ross.

The *Bulletin* is published by the University Press. In appearance, and in quality of paper, printing, and illustrations, it leaves nothing to be desired. We congratulate the editor, Dr. C. K. Clarke, and all others to whom the credit may be due.

Book Reviews

THE EARLY PAPERS OF W. J. AND C. H. MAYO. A collection of papers (published previous to 1909). By WILLIAM J. MAYO, M.D., and CHARLES H. MAYO, M.D. Two octavo volumes, averaging five hundred and fifty pages each, illustrated. Price per set, cloth, \$10.00 net. Philadelphia and London: W. B. Saunders Company, 1912. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

The object of the editor—or perhaps one should say editress—Mrs. M. H. Mellish, has been to collect and collate the papers and monographs published by W. J. and C. H. Mayo prior to the year 1909, when the first volume of the "Collected papers by the staff of the Mayo Clinic" was issued. The task was a difficult one, and the manner in which it has been accomplished in these two volumes reflects great credit upon Mrs. Mellish. That it has been a labour of love is very evident. The Mayos, like other busy men, evidently did not in the early days of their work, keep a careful list of their publications. Reprints were not so common in 1884 as they are to-day, and it is quite conceivable that the Index Medicus of that period would not contain all the references desired by the editor. But a careful search of the files of the then existing medical journals has doubtless made the list fairly complete. The papers, grouped under their respective headings, after the manner followed in the "Collected Papers," have been arranged in chronological order, and they thus afford a most interesting study of the evolution of the justly celebrated Mayo clinic at Rochester. These two volumes should, therefore, stand on the library shelf of every modern surgeon just in front of the series of "Collected Papers" which give the last word of the clinic on each subject touched upon. The hiatus was at the beginning of the series, and it has now been filled.

To consider, in detail, the papers included in these two volumes would be beyond the province of this review. It is also unnecessary, for many—nay most—of them are old friends, which need no notice. But a word as to the arrangement of the papers will be of interest to our readers. The first three hundred and twenty-three pages of Volume I are devoted to papers upon the surgery of the ali-

mentary canal, stopping at the duodenum; next follows one hundred and thirty-five pages upon the liver and gall-bladder, the remainder of the volume being devoted to articles upon the pancreas. Volume II begins with some general papers upon the peritoneal cavity, and then goes on to those dealing specially with the intestinal tract. Next, we find three articles devoted to the subject of operation for the radical cure of hernia, which is, in turn, followed by one hundred and ninety-four pages of genito-urinary literature. The vascular system is followed by the head—in which, *inter alia*, attention is given to the nasal sinuses and mastoid operations—and next follows some very interesting papers upon brain surgery. The papers on goitre are—as was to be expected—almost entirely the work of Charles H. Mayo. Under the caption, "Principles of Surgery," are collected several papers of varied interest, and the concluding articles—if we except a few case reports of minor interest—are from the pen of W. J. Mayo. They consist of graphic accounts of his visits to other surgical clinics in Europe and America, and also several addresses upon various subjects of general medical and educational interest.

To both volumes there is a very complete bibliography as well as a general index, which adds much to the value of the work. The paper, letter-press, and binding of this edition does great credit to the publishers, and is what one would expect from the house of W. B. Saunders Company.

THE TREATMENT OF SHORT SIGHT. By PROFESSOR J. HIRSCHBERG. Translated by G. LINDSAY JOHNSON. New York: Rebman Company, 1912.

This little book is a publication of an essay delivered by Professor Hirschberg to the students of Berlin. He classifies myopia into three grades, the highest grade ranging from 6 to 30 D. To illustrate the prevalence of the disease in Germany, the author states that of 12,328 patients in his clinic, 560 suffered from high degrees of myopia. After warning the optician in his own interest to avoid correcting such cases, the author cites some of the commoner complications of short sight; these are found to exist in thirty-four per cent. of advanced cases.

Great care should be exercised in prescribing lenses that are not too strong, particularly in high degrees, when both distance and near glasses are recommended to be worn. It is always best to examine under mydriasis; vitreous opacities, changes in the choroid,

detachment of the retina, and cataract are some of the commoner complications met with. Professor Hirschberg is undetermined as to the efficacy of atropine in arresting the progress of the trouble in children, and considers subconjunctival injections of normal saline solution of some possible value. He is rather in favour of abstinence from near work and a change of surroundings. The methods introduced by Deutchman and Müller for the cure of detached retina are hardly warranted; absolute rest in a fixed position and a sub-retinal section of the sclera are more rational measures to be adopted. The practice of De Wekker of inserting gold wire in the globe, the author regards as dangerous. The removal of the lens may be done in selected cases, but with the greatest caution.

The cure of disease is the avoidance of conditions which bring it about. Marriage between myopes should be discouraged. Kindergarten work, such as sewing and weaving, are injurious practices, and children during their early years should not be allowed books for any protracted length of time. The author also advocates less work at school for young children.

A SYSTEM OF TREATMENT BY MANY WRITERS. Edited by ARTHUR LATHAM, M.A., M.D. (Oxon.), F.R.C.P. (Lond.), and T. CRISP ENGLISH, M.B., B.S. (Lond.), F.R.C.P. (Eng.) Volume IV. Obstetrics and Gynæcology. Price, \$24.00 for the set of four volumes. Toronto: The Macmillan Company of Canada, Limited, 1912.

This work is the fourth and final volume of a "System of Treatment," and is devoted to the subjects of Obstetrics and Gynæcology. The volume contains, also, an extensive index of the whole system.

The subject of obstetrics is dealt with in four hundred and seventy-three pages. After a short chapter on the general management of pregnancy, the complications and abnormalities of pregnancy are dealt with in alphabetical order.

Dr. E. Hastings Tweedy, of Dublin, contributes the chapters on the management of normal labour, and the management of labour in special presentations. Other complications of labour are then dealt with in alphabetical order.

The management of the normal puerperium is followed by a section dealing with the complications of the puerperium in alphabetical order. Affections of the breasts during pregnancy and the

puerperium are dealt with in a separate section, and the management of the new-born child is followed by the obstetric operations in alphabetical order.

The subject of gynaecology occupies four hundred and ten pages. Mr. Victor Bonney, in the opening chapters of this section, deals with the general points in the technique of gynaecological operations, and the after-treatment and post-operative complications.

Diseases and disorders of the vulva, vagina, uterus, menstruation, ovaries, tubes, and broad ligaments are dealt with in alphabetical order, and special chapters are included dealing with non-haemorrhagic discharges from the genital tract, pelvic cellulitis, disorders of the sexual function, hermaphroditism and pseudo-hermaphroditism, and diseases of the female urethra and bladder.

There is the usual tendency to repetition and overlapping common to such compilations, and difference of opinion is manifest throughout the book. Being devoted entirely to treatment of the various conditions discussed, the general style is practical, clear, and very concise, and this section of the "System of Treatment" will, no doubt, prove very valuable to the busy general practitioner interested in the subjects with which it deals. The general arrangement of the book is such as to facilitate reference to its contents.

THE result of the election of the second Provincial Medical Council of Saskatchewan was announced September 18th, last. The first council of the Provincial Medical Association was elected in 1909 for a term of three years. The council remains as before, with the exception of one member, Dr. McCullough, of Moose Jaw, having taken the place of Dr. Kelly, of Swift Current. For election purposes, the province is divided into seven electoral districts and each of these districts sends one representative to the council. The members elected are: Dr. Thomson, of Regina, president; Dr. Young, of Saskatoon; Dr. Irving, of Yorkton; Dr. Argue, of Grenfell; Dr. Eaglesham, of Weyburn; and Dr. McCullough, of Moose Jaw.

Books Received

The following books have been received, and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

DIGESTION AND METABOLISM. THE PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY OF NUTRITION. By ALONZO ENGLEBERT TAYLOR, M.D. Philadelphia and New York: Lea and Febiger, 1912.

THE DIAGNOSIS OF NERVOUS DISEASES. By PURVES STEWART, M.A., M.D., F.R.C.P. Third edition, revised and enlarged; four hundred and seventy-seven pages; two hundred and twenty-four illustrations. Price, \$4.75. London: Edward Arnold. Toronto: D. T. McAinsh and Company, 1912.

THE THERAPY OF SYPHILIS. ITS DEVELOPMENT AND PRESENT POSITION. By DR. PAUL MULZER, of Berlin, with a preface by PROFESSOR P. UHLENHUTH, M.D. Translated by A. NEWBOLD. Price, cloth, \$1.50 net. New York: Rebman Company, 1912.

AUTO-INTOXICATION AND DISINTOXICATION. AN ACCOUNT OF A NEW FASTING TREATMENT IN DIABETES AND OTHER CHRONIC DISEASES. By DR. G. GUELPA, of Paris. Translated by F. S. ARNOLD, B.A., M.B., B.Ch. (Oxon). With an introduction by the translator and a chapter on the use of the method in the treatment of morphine addiction by OSCAR JENNINGS, M.D. Price, cloth, \$1.25 net. New York: Rebman Company, 1912.

A TREATISE ON DISEASES OF THE HAIR. By G. T. JACKSON, M.D., and C. W. McMURTRY, M.D. Illustrated with one hundred and nine engravings and ten coloured plates. Price, cloth, \$3.75 net. Philadelphia and New York: Lea & Febiger, 1912.

PRACTICE OF MEDICINE. A MANUAL FOR STUDENTS AND PRACTITIONERS. By HUGHES DAYTON, M.D. Second edition, revised and enlarged. New York and Philadelphia: Lea & Febiger, 1912.

ELEMENTARY BACTERIOLOGY AND PROTOZOLOGY. THE MICROBIOLOGICAL CAUSES OF THE INFECTIOUS DISEASES. By HERBERT FOX, M.D. Illustrated with sixty-seven engravings and five coloured plates. Price, cloth, \$1.75 net. Philadelphia and New York: Lea & Febiger, 1912.

THE PRINCIPLES OF HUMAN PHYSIOLOGY. By E. H. STARLING, M.D., F.R.C.P., F.R.S. Octavo with five hundred and sixty-four illustrations. Price, cloth, \$5.00 net. Philadelphia and New York: Lea & Febiger, 1912.

A MANUAL OF CHEMISTRY. A GUIDE TO LECTURES AND LABORATORY WORK FOR BEGINNERS IN CHEMISTRY. A TEXT-BOOK SPECIALLY ADAPTED FOR STUDENTS OF MEDICINE, PHARMACY, AND DENTISTRY. By W. SIMON, PH.D., M.D., and DANIEL BASE, PH.D. New (10th) edition, enlarged and thoroughly revised; illustrated with eighty-two engravings and nine coloured plates. Price, cloth, \$3.00 net. Philadelphia and New York: Lea & Febiger, 1912.

LIFE AND LETTERS OF DR. WILLIAM BEAUMONT, INCLUDING HITHERTO UNPUBLISHED DATA CONCERNING THE CASE OF ALEXIS ST. MARTIN. By JESSE S. MYER, A.B., M.D., with an introduction by SIR WILLIAM OSLER, Bt., M.D., F.R.S. With fifty-eight illustrations. St. Louis: C. V. Mosby Company, 1912.

BACTERIOLOGY AND PATHOLOGY FOR NURSES. By JAY G. ROBERTS, PH.D., M.D. Price, cloth, \$1.25 net; illustrated. Philadelphia and London: W. B. Saunders Company, 1912. Canadian Agents; The J. F. Hartz Company, Limited, Toronto.

THE PRACTITIONER'S ENCYCLOPÆDIA OF MEDICINE AND SURGERY, IN ALL THEIR BRANCHES. Edited by J. KEOGH MURPHY, M.C., F.R.C.S. 1443 pages, with illustrations; price, \$8.00. London: Oxford University Press. Toronto: D. T. McAinsh and Company, 1912.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By H. A. HARE, M.D. Fourteenth edition; nine hundred and eighty-four pages with one hundred and thirty-one engravings and eight full-page coloured plates. Price, cloth, \$4.00 net. Philadelphia and New York: Lea & Febiger, 1912.

HYPNOSIS AND SUGGESTION. THEIR NATURE, ACTION, IMPORTANCE, AND POSITION AMONGST THERAPEUTIC AGENTS. By W. HILGER, M.D. Translated by R. W. FELKIN, M.D., F.R.S.E.; with an introduction by DR. VAN RENTERGHEM (Amsterdam), translated by A. NEWBOLD. Price, cloth, \$2.50 net. New York: Rebman Company, 1912.

THE PATHOLOGY AND TREATMENT OF DISEASES OF WOMEN. Fourth edition, rewritten by A. MARTIN and PH. JUNG. Only authorized English translation by H. SCHMITZ, M.D. With one hundred and eighty-seven illustrations. Price, cloth, \$5.00. New York: Rebman Company, 1912.

THE CARE OF THE SKIN AND HAIR. By W. A. PUSEY, M.D. New York and London: D. Appleton & Company, 1912.

THE LOCAL INCIDENCE OF CANCER. By CHAS. E. GREEN. Edinburgh and London: Wm. Green & Sons, 1912.

REPRODUCTION IN THE HUMAN FEMALE. By JAMES YOUNG, M.D. Edinburgh and London: Wm. Green & Sons, 1912.

PRINCIPLES OF HYGIENE: FOR STUDENTS, PHYSICIANS AND HEALTH OFFICERS. By D. H. BERGEY, M.D. Fourth edition, thoroughly revised; octavo of 529 pages; illustrated; price, cloth, \$3.00 net. Philadelphia and London: W. B. Saunders Company, 1912. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

SURGERY OF THE BRAIN AND SPINAL CORD BASED ON PERSONAL EXPERIENCES. By PROFESSOR FEDOR KRAUSE, M.D. English adaptation by Dr. Max Thorek. Volume II. Illustrated. Price \$7.00 net. New York, Rebman Company, 1912.

Men and Books

BY SIR WILLIAM OSLER, M.D., F.R.S.

XV. THE WORKS OF JOHN CAIUS, M.D. In connexion with the four hundredth anniversary of the birth of John Caius, the governing body of his Cambridge college and the president and fellows of the Royal College of Physicians have published an edition of his works (Cambridge University Press, price 18s. net). Few men of his generation deserve to be held in more grateful remembrance, not so much for his works, though numerous and important, as for the character of the man and for what he did for the Royal College of Physicians and for his old college at Cambridge. Caius recognized the value of the organic life of the institutions of which he was a member. Of the London college he was president for many years, and he was "the inventor of that insignia of honour by which the president of the college is distinguished from the rest of the Fellows," and his silver caduceus is still carried by that officer. The annals of the college from 1555 to 1572 in manuscript appear in print in this volume for the first time. "He was so religious in observing the statutes of the college that, though old, he durst not absent himself from the college's *cunilia* without a dispensation." He restored the tomb of Linacre, the founder of the college, in St. Paul's Cathedral.

But Caius is most worthily remembered to-day by having, in Fuller's words, "improved the ancient Hall of Gonvil into a new college, of his own name," and to-day, as in the seventeenth century, he carries away, as Fuller has it, "the name of the college in common discourse." The charter of the new foundation, 1557, was accompanied with substantial gifts in lands and money, and two years later he became the master, though continuing his practice in London. While imbued with the new learning, Caius had a mediæval mind, filled with the sense of the universal symbolism in material things. On the occasion of the feast, when refounding the college, he gave a cushion of reverence, a rod of prudence—a silver caduceus still in its possession—and a book of knowledge. And this is seen in the gates of the new court, which he built: one low and little, *Humilitatis*; the next, a portico of handsome proportions,

Virtutis; a third leading to the public schools, through which all had to pass for their degrees, was inscribed, Honoris.

As an author, Caius occupies a distinguished place in the literature of the sixteenth century. A profound scholar, he has the rare distinction, unique perhaps for an Englishman, of having been elected "dialectes Græci professor" at Padua, where he was the friend and colleague of Vesalius, with whom he lived for eight months. Following the example of Jerome Cardan, he wrote a work, "De libris propriis," and gives seventy-two titles, "including sixteen original works, seven versions from the Greek and Latin, and ten commentaries, besides texts discovered, edited, and amended." A majority remained in manuscript, and have been lost. The medical work by which he is best known is "A boke or counseill against the disease commonly called the sweate or sweatynge sicknesse," an exceedingly rare work, one of the few of his original editions that I have never been able to procure. It is the first monograph in English on a separate disease. Caius had studied the fifth outbreak, a remarkable epidemic which began at Shrewsbury in 1551 and spread rapidly through England with a very high mortality. One cannot but wish that he had given us more symptoms and less treatment, but there are many shrewd observations. He urges the people to "seke out a good physicien and knownen to have skille, and at the leaste be so good to your bodies as you are to your hosen and shoes," for which the best makers are sought.

The little book on "British Dogs," prepared for his friend, Conrad Gesner, has been often reprinted. His longest work is "De Antiquitate Cantabrigiensis," "a fardell of strange antiquities," as one of his friends calls it. One Key or Caius of All Souls' College, Oxford, having extolled the antiquity of his University as founded by Greek philosophers, companions of Brutus, and restored by King Alfred, at the instigation of Archbishop Parker, John Caius asserted the antiquity of Cambridge and "with all the forms of antiquarian certainty and precision he established its foundation by one Cantaber 394 B.C. and in the year of the world 4300—gaining a priority of 1,267 years from Alfred."

He edited several of the books of Galen, for which he collated manuscripts in Italy, some of which are now in the library of Caius College.

It is sad to think that a man of his learning and devotion should have lost touch with the members of his own college, and that his last years should have been darkened with unseemly quarrels. Apparently he stuck to the old faith and was charged,

not only with a "shew of a perverse stomach to the professions of the Gospel, but atheism." The fellows and students of his own college, aided by the Vice-Chancellor of the University, the Master of Trinity, and the Provost of King's, sacked his chambers and made a bonfire in the college court of the ornaments and ecclesiastical furniture and vestments. Fuller's characteristic comment upon him is: "We leave the heat of his faith to God's sole judgement, and the light of his good works to men's imitation."

THE report of the Calgary General Hospital for August gives the following information: four hundred and three patients were admitted during the month, the total number of hospital days was five thousand two hundred and fifteen, and the number of births nineteen. Of the patients admitted, one hundred and fifty-four received treatment free of charge at a cost to the hospital of \$5,223.48. The expenses of the hospital have increased greatly during the past year: in August, 1911, \$5,542.55 was expended, while in the same month this year \$7,348.59 was spent. The number of patients, also, has increased, two hundred and eventy-eights being admitted in August, 1911, as compared with four hundred and three this year. At present, the hospital provides room for one hundred and fifty patients, and two hundred and eight patients are receiving treatment. The accommodation is far from adequate, and an extension is badly needed. In order to improve the conditions temporarily, two large tents have been hired and are in use. The question of submitting a by-law to the city to provide \$150,000 with which to enlarge the hospital is under consideration.

Res Judicatae

MEDICAL EDUCATION IN EUROPE

THE Carnegie Foundation for the advancement of learning has issued another of its important bulletins, which is the sixth in the series. Upon a previous occasion, it will be remembered, a similar bulletin was issued upon medical education in the United States and Canada. Whilst that publication did something less than justice to many institutions, its effect was instantaneous and profound. As a result, several medical schools in the United States closed their doors, and all of those in Canada which came under criticism added to their equipment, and increased their staff, and now conform with a higher medical standard. Although the present report was issued only a few months ago, results are already seen in more than one European institution. Indeed, one important medical school has entirely remodeled its pathological department and appointed a new director.

This bulletin, which is a volume of three hundred and fifty-seven pages, follows in the main the general plan adopted in the previous one. The writer, Dr. Abraham Flexner, first gives an historical statement in which he describes the background upon which modern medical education in Europe is to be seen. Then he considers the basis of medical education and the relation of professional training to the general school system. The branches which are usually studied in laboratories are then estimated, and in succession come the clinical studies and the hospital, as related to the problem of clinical teaching.

By way of introduction Dr. Henry S. Pritchett presents what is, in reality, an admirable summary of the report with certain reflections of his own. To some of these one must demur, or at least insist upon the provision that when the writer refers to America he does not necessarily include that part of the continent which is known as Canada. The report establishes the fact that well-trained young physicians find no difficulty in attaching themselves to a retinue of hospital staff physicians and surgeons in Germany, but Dr. Pritchett complains that in America this is practically impossible. To some extent, at least, he claims that

this is due to the fact that hospital physicians, engrossed in practice, are unwilling that their prestige should be lessened by the scientific achievements of younger men working in their wards, and he charges the laymen in control of hospitals to break up this attitude by insisting that hospital opportunities do not exist for the professional benefit of the visiting staff. In Canada, as the medical schools come into closer relation with the university, the hospitals also seem to be drawn into the combination, and all three coördinate in harmony.

Again, Dr. Pritchett complains that in the United States the commercial aspect is given to the entire profession, because certain successful physicians exact fees wholly out of proportion to the service which they render. A physician, or surgeon, he says, who levies upon a rich man a fee of many thousand dollars, simply because he is a rich man, has exploited the patient at the expense of his profession. Accordingly, he is disposed to think that the interest of rich men is alienated from medical education, and that of the stream of generosity which has flowed out for the past twenty-five years none finds its way into the coffers of the medical school. Whether this reasoning be correct or not, it does not apply to Canada, for there is no case on record in which a Canadian physician or surgeon has exacted an exorbitant fee, notwithstanding the presence of an abundance of rich patients in their midst; and of all the faculties of one university at least none has benefited so largely in private gifts as the medical school.

But it would appear that the institutions of the United States were not so quick as the institutions in Canada to avail themselves of the advice which was offered in the earlier bulletin, that they should either mend their ways or go out of existence. Surveying the whole field, Dr. Pritchett affirms that scandal in medical education exists in America alone. In no foreign country is a medical school to be found whose students do not learn anatomy in the dissecting room, and disease by the study of sick people. It has remained for the United States to confer annually the degree of Doctor of Medicine upon hundreds who have learned anatomy from quiz-compends and whose acquaintance with disease is derived not from the study of the sick, but from the text-books. In no European country, he continues, is it possible to find such an "educational farce," and Dr. Pritchett concludes that if the least terms upon which a medical school can exist abroad were applied to America, three-fourths of the existing schools would be closed at once. And he adds that the remaining one-fourth would be easily and entirely adequate to meet the public need.

Another distinction between the medical situation in the United States and in Europe is that whilst quacks and quackery existed in both, in Europe a quack must register as a quack and cannot designate himself as a doctor of medicine. In the United States he is able to provide himself with the degree of Doctor of Medicine, sometimes by purchase but oftener by attending a nominal course at some proprietary medical school.

One theme runs through both bulletins, namely, that proprietary schools are the bane of medical education, and that safety alone is to be found in the universities. Whether the field under survey is the United States, England, or Scotland, the formula is the same, that the proprietary school is an unmitigated evil, and that hospital trustees are debasing charity by placing hospital facilities at their disposal.

It is a common contention that second-rate schools are a necessity in order that cheaply trained physicians be furnished for the sparsely settled districts of the country, but this bulletin proves that no physician, poorly equipped or well equipped, will go where a livelihood cannot be gained. "I hold it unrighteous in principle," the great Billroth declared, "to give the country worse doctors than the city," and fortunately there is no law which compels ill-trained doctors to fasten themselves upon the backward parts of the community. In the old days, the incomplete surgeon, the Wundarzt, as he was termed, was licensed to ply his trade within a prescribed locality, but at the present day, as Dr. Flexner remarks, this species of professional villeinage is no longer suitable to democratic conditions.

This bulletin then carries four significant suggestions as summarized by Dr. Pritchett, which bear upon training for professional life: first, the dependence of such training on preliminary education and the necessity for a close relation between the secondary and the professional school; secondly, the part which right lines of study in the secondary school may play in determining the quality of the work which the student in the professional school is apt to perform; thirdly, the advantage which the average student derives from a logical arrangement of subjects, provided fair scope for elasticity and election is still preserved; and finally, the wholesome effect of an examination system, at the close of the professional study, which shall at one and the same time test theoretical knowledge, ability to think, and technical skill.

The profession of medicine, and those whom the profession of medicine is intended to serve, will be indebted forever to the Carnegie

Foundation and to Dr. Flexner for this extensive investigation. Medical education has been brought into the light, and teachers and institutions are made to feel their responsibility towards the profession and towards the world. Dr. Flexner has enunciated certain principles which, of course, are not new, but he has given them a certain newness by his force of presentation. He insists, for example, that medical education is an affair of education; that rules and formulæ will not suffice, that all education is one, that the student must integrate into himself and assimilate his teaching so that he becomes a new creature.

This is far from saying that the author is infallible. Indeed, he bears the marks of time and place, of birth and of that education which, on its own showing, is the worst in the world. The American is a mechanical person. He has not quite realized that there are people in the world living their own lives beyond the borders of the United States. In so far as those people differ from himself he accounts them mad. Reared in an atmosphere of democracy he can only regard those who prefer monarchical institutions as insincere in their opinion, dishonest in their expression, and servile in their nature. Without a classical education himself, he can only explain its prevalence in other countries on the ground that "an obsolescent education is one way of hedging an aristocracy about" (page 37). He is brought up in worship of the machine, and when he is brought face to face with German "homogeneity and uniformity" he rolls on the floor in ecstasy. He is incapable of understanding any system in which homogeneity and uniformity do not prevail. He cannot perceive that any system of education becomes vicious just at the moment when it becomes a system, and that the institutions natural to communities are the best just because they possess them. A community cannot adopt new institutions any more than a child can adopt a father.

So long as Dr. Flexner confines himself to observation and record, his results are precious and will prove themselves to be, as they have proved in the past, a powerful influence in reforming medical education. He is alert, industrious, and experienced; but when he attempts an historical survey and a consideration of the basis of medical education in other countries than his own, he comes to the task with closed eyes and a mind already made up.

Accordingly, he fails entirely to comprehend medical education in England and in France, because it is not governed by homogeneity and uniformity. If he himself had had a classical education he would probably not employ such words as "motivated" and

"functionated," and he would perceive the barbarity which lurks in the phrase, "digesting the scientific point of view." It would be unfair to say that he is unjust. He does not understand. He and the Englishman are thinking in different categories. The English student is by nature individual and lawless. He takes his education in his own way, just as the Scotch student takes his education as he takes his catechism.

Still more strange, Dr. Flexner is so scientific and so determined to observe exactly, that his own records disprove his pre-conceived theories. In his historical survey he has nothing but scorn and humour for the incoördinated methods which go by the name of the English system, and admiration for German exactness; and yet, when he comes to consider in detail the teaching of medicine in the respective countries, he is bound to admit that in England "the method outlined fills every requirement of sound and thorough teaching" (page 208), whilst in Germany the clinical teaching is "the wrong proportion in the wrong chronological relationship."

If Dr. Flexner were to re-write his theories from his own evidence rather than, as appears to have happened, before he came upon the scene, we should have a different result. An appeal to the results does not convince him that the queer, incoherent, diverse methods employed in London are less effectual than the homogeneity and uniformity of Germany. All depends on what it is desired to accomplish, and who shall say that the average English physician is less competent than the average German to bring healing and comfort to the bedside even of a German patient? The English student, even if he acquires nothing else, acquires a certain humanity because he comes in continual and close contact with suffering human beings, whilst the German has been spending "three years mainly of listening."

It is not uncommon for German laboratory workers to fall ill, and it has been remarked frequently that they seek advice and treatment from an English colleague. The wonder is when, and where, German students learn to treat their patients. As a matter of fact, many of them never learn. Comparatively few become internes. It is quite true, as Dr. Pritchett remarks, that an American graduate in medicine can for the asking obtain the entrée to the clinics of Berlin, Vienna, or Munich. It is also true that the majority of German graduates begin practice without ever having been brought into personal contact with patients, precisely as happens in the United States.

By all the rules, English medicine should break down hopelessly

when it is put to the test. But, as a matter of fact, it does not, either in practice or in scientific advancement. Much of the work which is credited to German laboratories and clinics is the product of English workers, and American workers too; and it has happened that these workers have been driven from their high seats because their results could not be made to accord with the traditions of the place. The very freedom of English medicine keeps it mobile and assimilative; and it would, one would think, have occurred to Dr. Flexner to enquire more closely how it is that the English field is the most fertile in Europe. It will not do to explain, as he does, these extraordinary results on the ground of occasional brilliancy. When the light is so steady there must be a primary cause. Indeed, it is not improbable that not even an occasional gleam would escape if English medicine were encased in a German cuirass.

The London schools, of course, at the moment are in a bad way, and Dr. Flexner's criticism will be an incentive to better things, as it has been in other cases where he confined himself to observation. What the remedy is no one appears to know, and none but the English themselves can find out. It is doubtful if his panacea of university control will serve; for, as he justly observes: "about university relationship itself there is no magic; its virtue depends wholly upon the character of the university; whether in the future the university connexion will prove equally important obviously depends on the future adequacy of the universities."

For years the conscientious physician has been in despair because he could not master the technique of German mechanics or employ continental machinery in diagnosing affections of the heart, when suddenly James Mackenzie, a village practitioner in Burnley, demonstrated that the laborious charts produced by revolving cyclinders were inconclusive even when they were not fallacious. In medicine there is place for the mind as well as for the fingers.

To French medicine, also, Dr. Flexner does less than justice in his preliminary comment; and yet with extraordinary acumen he discovered later that "medical education in France depends on the accumulation of impressions which tend in time to classify and distinguish themselves" (page 285); and this because the French mind is plastic and logical, and can deal with material in no other way than by receiving impressions and subsequently arranging them in proper categories.

A. M.

Retrospect of Medicine

VACCINATION AS A PREVENTIVE AND THERAPEUTIC MEASURE IN TYPHOID FEVER

ALBERT AND MENDENHALL: REACTIONS IN ANTITYPHOID VACCINATION. *American Journal of Medical Sciences*, February, 1912.

WILLIAMS: VACCINATION AGAINST TYPHOID IN THE UNITED STATES ARMY. *American Journal of Medical Sciences*, March, 1912.

PHELAN: VACCINE INOCULATION PROPHYLACTIC AND CURATIVE OF TYPHOID FEVER. *Journal of American Medical Association*, 1912, No. 9.

CALLISON: THE THERAPEUTIC USE OF VACCINES IN TYPHOID FEVER. *American Journal of Medical Sciences*, September, 1912.

FROM a perusal of these articles one may get an idea of the advance made in the treatment of typhoid fever by the use of dead typhoid bacilli, as well as of some of the immediate results induced by this treatment. Albert and Mendenhall have observed the white cells under vaccine treatment and conclude that there is a polymorphonuclear leucocytosis as well as an increase in the large mononuclears. Their general conclusions, which are in accord with the observations of Williams and others, are:

1. Statistics based on a large number of cases show conclusively that antityphoid vaccination confers a marked degree of protection against typhoid fever.
2. The injection of typhoid vaccines induces a local reaction in all cases and a general reaction in some cases.
3. A previous attack of typhoid fever apparently causes the reaction to be more severe than is observed in individuals who have not had typhoid fever.
4. Antityphoid vaccination causes a marked increase in the specific agglutinins, opsonins, and bacteriolysins.

5. The injection of typhoid vaccines causes a marked polymorphonuclear, neutrophile, and large mononuclear leucocytosis.

6. The marked increase—both absolute and relative—of the large mononuclear leucocytes in the peripheral blood is the only leucocytic change which is common to both clinical typhoid fever and antityphoid vaccination.

7. Such occurrences suggest that these leucocytes have something to do with the formation of antibodies concerned with the production of antityphoid immunity.

8. It seems well worth while to attempt experiments on the artificial production of large mononuclear leucocytosis and to see what relation such may have to the production of antibodies in the presence of typhoid infection or antityphoid vaccination.

Evidence of protection through vaccination against typhoid fever is forthcoming from many sources which may be numerically expressed by saying that the incidence of the disease is reduced by fifty per cent., while the mortality is reduced almost seventy-five per cent.

Callison's article summarizes the published observations on the treatment of typhoid fever. In all, there are four hundred and seventy-five cases, with a mortality of 5·4 per cent. and relapse of 6·5 per cent., reported during the last three years. The conclusions closing this paper are:

1. Vaccine treatment in typhoid fever will reduce the percentage of deaths and lessen the number of relapses.

2. Complications are less frequent in vaccine-treated cases, and the original attack seems to be shortened in severe cases.

3. To give the best possible results, vaccine treatment should be instituted as early as it is possible to make a diagnosis, before the patient is exhausted and complications occur.

Vaccination is performed by injecting three successive doses, with ten-day intervals, into the subcutaneous tissue of the left arm over the insertion of the deltoid. The first dose contains five hundred million killed typhoid bacilli, the second and third dose each one billion bacilli in sterile salt solution. There is a definite, general, and local reaction—varying with individuals—lasting from a few hours to two or five days. Headache and fever (102°), malaise, backache, etc., while locally a swelling of tissues and in the axilla slight glandular enlargement, follow the injections. The Widal reaction is invariably positive after vaccination and usually remains present for nearly a year. In the United States Army the present plan is to vaccinate every three years.

EXOPHTHALMIC GOITRE

SOLOMON SOLIS COHEN: THE NON-SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.

JOHN H. MUSSER: PROBLEMS IN THE TREATMENT OF EXOPHTHALMIC. *The American Journal of Medical Sciences*, June and July, 1912.

Each writer has set down at the end of his article the convictions or conclusions held on the subject. Dr. Musser laid down the following as his convictions:

1. Endemic goitre should not be treated surgically until proper general treatment has been employed for a long period.
2. Surgical intervention should not be advised in cases of goitre associated with functional or organic disturbances of other secretory organs until the associated disorders are removed or relieved.
3. If relapse occurs in spite of general treatment or in spite of treatment directed against the disorders of other organs, a goitre should then be treated surgically.
4. Medical treatment should be continued from six to twenty-four months. Favourable results should not be promised unless the patient is under the absolute control of a physician, so that treatment by rest, diet, bathing, physical therapy, and so forth, may be carried out with precision and continuity.
5. Surgical intervention requires the same rigid and prolonged after-treatment to give permanent results. Finally, my conviction is that the surgeon does too much and the internist too little in the treatment of goitre.

Dr. Solis Cohen, in his summary, says, among other things, that surgical treatment rarely becomes necessary in cases recognized early. In approximately fifteen to twenty per cent. of cases, surgery is made necessary by failure or inability to institute prompt or proper, and persistent, non-surgical treatment. In about five per cent. of cases surgery may become necessary, despite early and skilful hygienic and medicinal management.

The first element in treatment, therefore, may be stated as *early diagnosis*. Non-surgical treatment is usually prolonged: its keynote is individualization. It must be patient and persistent. Its principal element is *rest*. "Under such management, with perhaps occasional symptomatic medication, somewhere from twenty-five to thirty per cent. of all patients may be expected to get well. . . . The application of ice coils over the heart and

cervical spine, the administration of trustworthy preparations of well-chosen organ-extracts and various forms of auxiliary medication, with perhaps the use of certain mechanical manipulations, topical applications, and electric modalities, will increase the number of recoveries to eighty per cent. or more."

ASTHMA

THE MANAGEMENT OF ASTHMA IN CHILDREN. By H. H. McCLENAHAN, A.M., M.D. *The American Journal of Medical Sciences*, June, 1912.

FURTHER EVIDENCE IN SUPPORT OF THE TOXIC PATHOGENESIS OF BRONCHIAL ASTHMA BASED UPON EXPERIMENTAL RESEARCH. By ALLAN EUSTIS, M.D. *The American Journal of Medical Sciences*, June, 1912.

ADRENALIN AND ASTHMA. (COPY OF ABSTRACT. *Archiv. f. exper. Pathologie und Pharmacologie*, 1911, LXVI, 205). JANUSCHKE AND POLLAK.

The interest in asthma endures so long as its aetiology is a mystery and the treatment unsatisfactory. McClenahan's article, based upon the writer's experience of twenty cases and wide reading, presents the hopeful prognosis that the majority of infants and children suffering from asthma recover. Children are less liable to have attacks induced by irritation of the nerve filaments in the respiratory tract, by odours from animals or plants, than adults. They are less likely to be influenced by psychical impressions. In the management of cases occurring in young children, every possible source of irritation is to be considered, and since an attack of acute bronchitis induces a paroxysm in the majority of cases, the promptest attention to the first symptom of a "cold" is necessary. For the persistent wheezing and catarrhal bronchitis, the writer claims that the use of sodium iodide secures a decided benefit. And where there is general adenopathy or the bronchial glands are enlarged, ten to twenty minim doses, three times daily, of the syrup of hydrochloric acid bring relief. The fumes so highly recommended for adults fail with infants suffering from asthma, often increasing the cough. Adrenalin in from three to five minim doses has proven a most valuable remedy in two instances. It has likewise failed in the writer's practice. Morphin and again chloral hydrate have each given prompt relief. Nascent oxygen gave quick relief in a severe case.

Eustis, while working with Von Noorden and Richard Kraus, sought to prove this hypothesis: "If asthma is caused by intestinal toxæmia, a definite toxin exists, which causes bronchial spasms similar in action to muscarin, and this toxin originates in the intestinal canal." It is claimed that Charcot-Leyden crystals are amins closely allied to putrescin and cadaverin. On putrefaction the several amino-acids split off carbon dioxide and form their corresponding amins. Of these amins beta-imidazolylethylamin has a specific action on unstripped muscle tissue, causing contraction of the uterus as well as contraction of the bronchioles—inducing in rabbits and guinea-pigs great dyspnoea and death from complete occlusion of air by the tonic spasm of the bronchioles. Accidentally discovered while working with ergot, Barger and Dale later obtained this base from an extract of the intestinal mucosa of an ox. The actions of this base from the various sources,—ergot, intestinal mucosa, synthesis, and the putrefaction of histidin, were all similar. Using this base for experimental purposes, Eustis confirmed the results of Dale and Laidlaw,—contraction of the uterus and bronchioles, with death of the animal from very small doses. The lungs were found pale, enormously distended, and protruding from the thorax. Given by the subcutaneous and intraperitoneal method, the action on muscular tissue is entirely local, suggesting the detoxicating action of subcutaneous tissue. So far, this base has not been isolated from the blood of asthmatics. It has been isolated from three specimens of faeces, while in twelve other specimens the tests were negative.

The urine of asthmatics injected, induced in normal rabbits and guinea-pigs characteristic bronchial spasm and death, with the characteristic post mortem appearances of lungs already described.

These experiments, which must be accepted as preliminary evidence, suggest that the normal individual possesses the power of detoxifying all the toxic amins formed from intestinal putrefaction, while the asthmatic individual has lost this power.

The favourable action of adrenalin in cases of asthma, as shown by experiments on dogs and cats made by Januschke and Pollak, is due to the relaxation of bronchial spasm. All forms of the asthma experimentally induced are not favourably induced by adrenalin. Those due to muscarin and peptone are relieved, while those caused by beta-imidazolylethylamin and ergotoxin are unaffected. Thus, the use of adrenalin may serve to determine the part played by bronchial constriction in causing asthma.

Obituary

DR. ANTOINE LONGPRE, of Papineauville, Quebec, died September 15th, in the eighty-first year of his age. Dr. Longpré was born at St. Léonard-de-Port-Maurice and studied medicine at Montreal and at New York; he graduated in 1857. He was a well-known figure in Papineauville, where he had practised his profession for the past fifty years, and where for many years he held the position of mayor.

DR. W. MCLEOD, of Saskatoon, was thrown from his horse and instantly killed on Friday afternoon, September 20th.

DR. J. J. ANDERSON, of Brandon, Manitoba, died September 21st, in the fifty-second year of his age. Dr. Anderson was born in Kemptville, Ontario. He began his professional career in Wanessa, Manitoba, and after spending several years there went to Brandon, where he was superintendent of the hospital for the insane until a couple of years ago. Dr. Anderson was well known throughout western Manitoba, and his genial personality gained for him the respect and liking of all those with whom he came in contact. He leaves a widow and one child.

DR. J. G. COLLVER, of Waterford, Ontario, died September 2nd, in the eighty-fifth year of his age. Dr. Collver was a well-known figure in Waterford, where he had practised for over forty years. He was born in Old Windham and is survived by one son and one daughter.

DR. WILLIAM REAR, of Toronto, died in the Nicola Street Hospital at Vancouver on September 29th, in the seventy-fourth year of his age.

DR. SYDNEY WRIGHT, of St. Thomas, Ontario, died from heart failure at Peru, Indiana, on October 2nd.

DR. THOMAS H. QUIRK, of Calgary, was killed in a motor accident on October 1st.

DR. JOHN COULSON HOWIE, of Glasgow, Scotland, died in the General and Marine Hospital at St. Catharines, Ont., on October 3rd, in the fiftieth year of his age. Dr. Howie was the eldest son of the Rev. Robert Howie, of Glasgow, and was a graduate of Glasgow University. He practised for fourteen years in Glasgow and for several years was connected with the Samaritan Hospital for Women. He was obliged to give up his practice on account of ill health and came to Canada in the hope of gaining strength. He leaves a widow and three children.

DR. WILLIAM REAR, of Toronto, died in Vancouver, September 28th. Dr. Rear, who was in his seventy-third year, gave up his professional work three years ago and became interested in real estate and fruit farming in British Columbia. Dr. Rear was well-known in Masonic circles, and in politics was a Liberal. Death was due to heart failure.

DR. E. H. ROULEAU died September 30th, after a brief illness. Dr. Rouleau was a well-known physician in Calgary, and, for fifteen years, acted as Belgian Consul. He was born at the Isle of Verte, Que., in 1843 and was a graduate of Laval University.

News

THE CANADIAN PUBLIC HEALTH ASSOCIATION

THE annual congress of the Canadian Public Health Association was held in Toronto on September 16th, 17th, and 18th. The meetings took place in the university buildings and throughout were a decided success. The attendance was in excess of last year, while the enthusiasm manifested in both the general sessions and the sections was most spontaneous. The general standard of the papers read was good, while their tenor was of such a vivid and yet practical character that discussions of great value, not only to the physician but to every one interested in social betterment, ensued. If any feature of the meeting should be accentuated, it is probably the interest taken in the event by the general public, a fact due largely to the marked influence which modern preventive medicine, in distinction to medical practice of the past, is beginning to exert on the general welfare of communities.

On Monday, September 16th, the meeting of the first general session took place and the papers read were: Dr. P. H. Bryce, "How shall Canada save her people from the physical and mental degeneracy due to industrialism as seen in the great cities of older civilization"; Dr. J. H. Elliot, "Tuberculosis"—this paper was followed by a discussion; Dr. H. G. Roberts, "Prevention of tuberculosis in the country"; Dr. Bruce Smith, "Hospitals, their relation to the community and public health"; Dr. Adam Wright, "Dust in the house and in the street"; Dr. J. W. S. McCullough, "The Ontario Public Health Act"; Mr. T. Aird Murray, C.E.; "Purification of water by slow and rapid sand filtration"; Dr. A. P. Reid, "Medical inspection of public schools."

In his paper, which explained the provisions of the New Health Act for the province of Ontario, Dr. McCullough emphasized the fact that the greater proportion of typhoid epidemics has arisen from the culpability of municipal authorities in respect to proper water supply and disposal of sewage. He instanced Ottawa, as an example in which over one thousand cases had occurred in a year, as a result of such neglect. The provisions of the present Public Health Act make it compulsory for municipalities to attend to such important matters. Other notable features are the constitution of local boards of health and the classing of tuberculosis as a communicable disease.

The sectional meetings were held on Tuesday, September 17th, and the papers read were: Section I. Military hygiene. Colonel G. C. Jones, "Sanitation of a besieged city or town"; Colonel D. B. Bentley, "The Sanitation of a bivouac"; Major T. B. Richardson, "Some observations on sanitation for the soldier"; Major Lorne Drum, "The Militia as a factor in public health"; Lieut. C. Laidlaw, "Simple means for ensuring safety of drinking water on active service." Section II. Milk Inspection. Dr. G. G. Nasmith, "Municipal milk inspection in Toronto"; Mr. Robert Awde, "Municipal food inspection"; Mr. L. A. Wilson, "Dominion meat inspection"; Mr. A. R. B. Richmond, "Municipal inspection."

Mr. Wilson quoted the following figures of condemnation made in Toronto during the past year:—the total number of carcasses condemned was 1,608; total portions condemned, 212,935; total carcasses slaughtered, 887,944. The detail figures are:—Cattle slaughtered, 117,256; carcasses condemned, 918; portions condemned, 34,307; sheep slaughtered, 41,660; carcasses condemned, 99; portions condemned, 3,471; swine slaughtered, 612,958;

carcasses condemned, 524; portions condemned, 168,701; calves slaughtered, 16,424; carcasses condemned, 53; portions condemned, 80; lambs slaughtered, 99,646; carcasses condemned, 14; portions condemned, 6,376.

Section III. Engineers and Architects. Mr. J. Race, "Toronto filtration plant"; Mr. T. Lowes, C.E., "A complete sewage disposal plant for a public institution"; Mr. H. G. Cowan, C.E., "How to obtain efficiency from pressure filters"; Mr. N. Couchon, C.E., "Housing and ventilation"; Mr. R. R. Knight, "Storm and surface water drainage in relation to sewage disposal"; Mr. T. H. Hogg, C.E., "The relations between the medical health officer and the engineer."

Section IV. Medical Officers of Health. Dr. C. J. C. O. Hastings, "A modern hospital for communicable diseases"; Dr. J. F. Honsberger, "The International Hygiene Exhibition, Dresden"; Dr. Whitelaw, "Municipal control of milk supplies"; Dr. A. J. Douglas, "The importance of trained sanitary inspectors."

Section V. Medical Inspection. Dr. J. H. Elliot, "Tuberculosis in children"; Miss L. L. Rogers, "Nursing side of medical inspection of schools"; Dr. W. E. Struthers, "Lantern slides of the work of medical inspection of schools in Toronto"; W. H. Doherty, D.D.S., "The dental aspect of medical inspection of schools."

Section VI. Social workers. Mr. J. H. T. Falk, "Prevention of social misery"; Dr. A. W. Thornton, "The dentist as a social worker"; these papers were followed by a symposium on "The scientific management of household work and workers."

Mr. Falk's paper was of particular interest. He said: "Charities, well-intentioned as they are, have done more to prevent the coming of better social conditions than anything else. They should not attempt to hide social injustice, but to find the causes of social misery and force them on the attention of the general public. Poverty, sickness and crime may in a large measure be reduced by economic reform, but such reform, resulting in the more equal reward of labour, necessarily comes slowly. It should be made compulsory for the wage-earner to provide against sickness and resultant dependence. In Toronto and Montreal unemployment is a serious factor in producing poverty, and health authorities should take measures to minimize its effects. Necessary provisions are the establishment of employment bureaus and information bureaus, through which the demand and supply of labour could be made public, compulsory registration of employees, etc. Public charities, as a rule, are guilty of gross abuse of their opportunities.

Usually they are run by missions which cater to the homeless man, and not the married man temporarily out of a job who refuses to frequent a mission. This is an injustice to the latter man, while the former is taught to depend on casual work." Father Minehan, in discussing this paper, suggested the compulsory instruction of mothers. He also advocated the prosecution of those drawing rent from unsanitary houses which breed vice and disease. Other speakers were Rabbi Jacobs and Mr. W. W. Lee.

Section VII. Laboratory workers. Dr. H. W. Hill, "The future of public health laboratory work"; Dr. Revell and Dr. Nasmith also read papers.

The second general session was opened by the presidential address, delivered by Dr. Charles A. Hodgetts. In the course of his remarks, Dr. Hodgetts criticized the existing methods of inspecting immigrants coming to Canada, and pointed out the necessity of a more efficient medical examination. He also called attention to the importance of hygiene as a branch of medicine and commented upon the fact that the College of Physicians and Surgeons does not require a student to show any knowledge of hygiene in his final examination. Professor H. B. Anderson then read a paper entitled, "Diet in relation to disease." This was followed by a paper by Dr. W. T. Sherreff, and the session concluded with a paper on "A threatened outbreak of typhoid fever in Fort William and means taken to avert it," by Dr. R. E. Wodehouse.

The annual dinner was held on Tuesday evening. The speakers included the Hon. W. J. Hanna, provincial secretary; Dr. J. A. MacDonald, editor of the *Globe*; Dr. Hodgetts, President Falconer, Dr. Hastings, Mr. Justice Riddell, and Canon Cody.

The third general session was opened on Wednesday morning by a paper by Dr. H. W. Hill. The following papers were then read: Mr. A. J. Green, "Forest open-air schools"; Symposium, "Communicable diseases"; Dr. G. G. Nasmith, "The value of a public health laboratory to a municipality"; Dr. W. B. Kendall, "Of what value are sanitaria as a public health measure"; Mr. W. W. Lee, "The effects of immigration on the national health"; Dr. J. F. Goodchild, "The open window"; and Dr. J. L. Chabot, "A Federal public health department."

In the afternoon the business meeting was held and in the evening a musicale was given.

A NEW hospital is to be established at Moose Jaw, Saskatchewan, at a cost of three hundred thousand dollars.

THE Lamont Public Hospital was formally opened on Labour Day by the Hon. Duncan Marshall, minister of agriculture for the province of Alberta. The size of the hospital is thirty-seven by forty-three feet, and it is large enough to receive twenty patients. The total cost has been about \$10,500; of this amount \$1,000 was voted by the village council, but most of the money has been subscribed by the neighbouring communities.

MORE extensive hospital accommodation is needed at Windsor, Ontario. The only hospital in the county is the Hôtel-Dieu and this is by no means sufficient for a population of almost twenty thousand people, a population which is steadily increasing. The hospital is overcrowded, and it has been necessary, on several occasions, to refuse admission to most urgent cases, as it has been impossible to find accommodation for them. The matter was recently brought to the attention of the county council, and it is hoped another hospital will soon be erected.

A SMALL-POX hospital for Ottawa is in course of construction. The hospital is being built on Porter's Island and will contain two wards, one for male and one for female patients; each of these wards will be provided with thirty beds.

IT is proposed to make an addition to the general hospital at Niagara Falls. The name of the extension will be the Susan Thompson Memorial, and the funds will be provided by the legacy left to the hospital by the late Susan Thompson. The estimated cost is about thirty thousand dollars.

At a meeting of the Medical Association, which took place at London, Ontario, on September 25th last, it was unanimously resolved: "That the fee for day visits is to be \$2.00, subsequent visits to be charged for at the rate of \$1.50 to \$2.00, if no hardship exists. The fee for night visits is to be \$3.00." The meeting was attended by about fifty physicians.

A HOSPITAL is to be erected at Cobourg, Ontario. The building is to be ninety feet by seventy feet deep and will contain thirty-four beds. The work of construction is to be commenced at once.

THE next meeting of the American Hospital Association will be held in Boston in September, 1913.

THE Odd Fellows' Hall at Edmonton is to be converted into a hospital.

IT is proposed to erect a general hospital in the eastern part of Montreal on somewhat the same lines as the Western Hospital. Although the suggested hospital is to be established by the Jewish people of Montreal and staffed entirely by Jewish doctors and nurses, it will be undenominational, and therefore available to the public in general.

THE half-yearly meeting of the College of Physicians and Surgeons of the Province of Quebec was held in Quebec, September 25th last, under the presidency of Dr. L. P. Normand of Three Rivers.

THE following have received the degree of M.B. from Queen's University, Kingston: F. C. Anderson, Kingston; L. E. Crowley, Kingston; J. M. Laframboise, Vankleek Hill; A. McIntosh, Williamsburg; W. E. Mulcahy, Holyoke, Massachusetts; and J. A. Stewart, Brockville.

THE next annual meeting of the American Medico-Psychological Association will be held at Niagara Falls, from June 10th to June 13th, 1913.

AN outbreak of diphtheria is reported from London, Ontario. Several cases are now undergoing treatment at the Victoria Hospital; four of the cases are from one family.

THE town of Freeport, Ontario, is to have a sanitarium. The plans have been prepared and the work of construction is to be commenced at once. Fifteen thousand dollars have already been voted for the sanitarium, and the provincial department of health will provide twenty per cent. of the cost, in other words \$3,600, \$3,000 of which will be used to pay for the grounds. The province will also grant three dollars towards the maintenance of each patient, provided the charge made by the sanitarium does not exceed \$4.90.

WE understand from the London *Advertiser* that a campaign of instruction in public health is to be instituted by Dr. H. W. Hill, the director of the Institute of Public Health. Meetings are to be

held in the rural schools and instruction given in the prevention of disease and the danger of its transmission from one individual to another.

A NEW hospital is to be erected shortly at High River, British Columbia. It is probable, also, that a hospital will be built at Penticton, British Columbia.

THE first annual meeting of the directors of the Chilliwack Hospital, British Columbia, was held on Wednesday, September 4th. The hospital was opened February 28th, last, and since then thirty-four patients have been treated and the number of hospital days has been seven hundred and twenty-nine. The year has been a satisfactory one, and the financial report shows a balance of \$353.81 in favour of the hospital.

THE following cases of contagious disease were reported in Montreal during the month of August: diphtheria, 28 cases; scarlatina, 35 cases; typhoid, 51 cases; measles, 29 cases; whooping cough, 19 cases; tuberculosis, 87 cases; small-pox, 17 cases; cerebro-spinal meningitis, 2 cases; erysipelas, 6 cases; and varicella, 3 cases.

THE fortieth annual convention of the American Public Health Association was held at Washington on September 18th, 19th, and 20th last. Dr. Rudolph Hering, of New York, was elected president of the association, and Dr. James Roberts, of Hamilton, Ontario, vice-president. The association will meet next year at Colorado Springs, Colorado.

IT is proposed to establish a hospital for tuberculous patients in Quebec. A society has been formed consisting of some of the more prominent French-Canadian citizens, and generous contributions have been promised by the Quebec Seminary, Laval University, and other institutions. It is hoped that the movement will receive the general support of the citizens and that the much-needed hospital will be erected in the near future.

IT is the intention to erect a sanitarium at Berlin, Ontario, for patients suffering from tuberculosis. A by-law, which will provide fifteen thousand dollars for this purpose, was passed unanimously at a recent meeting of the city council.

At the meeting of the Canadian Public Health Association, Mr. L. A. Wilson, the chief inspector for the Dominion government in Toronto, stated that, during the past year, eight hundred and eighty-seven thousand nine hundred and forty-four animals had been slaughtered in Toronto and that of these sixteen hundred and eight carcasses and two hundred and twelve thousand nine hundred and thirty-five portions of carcasses had been condemned as unfit for consumption. In connexion with the question of pure meat supply, the erection of large, public abattoirs and the closing of all private slaughter-houses was strongly advocated by chief inspector Awde, of Toronto.

THE cost of the new hospital buildings which are to be erected at Saskatoon next year, is estimated at about four hundred thousand dollars.

DR. G. A. B. HALL, the medical officer of health for Victoria, British Columbia, gives a very satisfactory report of the health of that city. During the month of August, three cases of diphtheria and six of scarlet fever were admitted to the isolation hospital. Twelve cases of typhoid fever were treated, all of which had originated outside of the city. Only thirty-eight deaths occurred throughout the month, and of these seven were caused by cholera infantum.

THE question of forming a provincial sanitary association in each of the provinces, Manitoba, Alberta, and Saskatchewan, is under consideration. The duties of the provincial health authorities are arduous and extensive, and the work of such an organization as is now suggested would be very helpful and would doubtless improve the sanitary conditions throughout the province.

DURING the year ending March 31st, 1912, six passenger vessels arrived at the quarantine station at Grosse Isle, Quebec, with small-pox, two with cholera, and one with typhus fever. Three hundred and sixty-seven vessels underwent quarantine and the total number of passengers examined was one hundred and ninety-three thousand three hundred and thirteen. One hundred and two passengers were transferred from the vessels to the hospital, and two births and seven deaths occurred in the hospital.

A SANITARIUM for the treatment of tuberculosis is to be

established by the various cities and towns of Cape Breton. The cost of the construction and maintenance is to be shared by the civic authorities of the county.

OVER two thousand cases of communicable disease were reported in Ontario during August last, and more than one thousand of these were cases of typhoid fever, which resulted in ninety-four deaths. Eight hundred of these cases occurred in Ottawa. One hundred and seventy-nine cases of tuberculosis were reported, resulting in one hundred and nineteen deaths; three hundred and eighty-four cases of whooping cough, with thirty deaths; one hundred and ninety-three cases of diphtheria, with twenty-seven deaths; one hundred and forty cases of scarlet fever, with ten deaths; fifteen cases of infantile paralysis, eight of which were fatal —more than half of these cases occurred in the Niagara peninsula. Thirteen cases of spinal meningitis were reported, all of which terminated fatally, thirty-one cases of small-pox, and sixty-three cases of measles. The cases of tuberculosis reported are much more numerous than during the same month of last year, the figures being one hundred and seventy-nine this year as compared with eighty-two in August, 1911; this is due, probably, to the stricter regulations concerning this disease embodied in the new Health Act.

DR. J. W. S. McCULLOUGH, the chief health officer of Ontario, has been elected president of the Canadian Public Health Association for the year 1912-1913.

THE new hospital at Orangeville, Ontario, was formally opened on October 1st.

DR. BEEMAN has been appointed health inspector for Magrath, Alberta, at a yearly salary of one thousand five hundred dollars.

DR. J. P. CADE has been appointed medical officer of health for Prince Rupert, British Columbia.

THE plans are being prepared for the extension of the isolation hospital at St. Thomas, Ontario. It is proposed to utilize the building which now serves as an isolation hospital and which was erected seven years ago. A wide verandah is to be placed on the south side, and the building is to be provided with modern appliances. The public wards will be nine feet six inches by seventeen

feet and will contain two or three cots each; and the private wards will be eight by twelve feet. The cost of the alterations will be about three thousand dollars.

THE General Hospital at Brandon is filled to its utmost capacity. At the beginning of October there were one hundred patients in the hospital, and thirty of these were suffering from typhoid fever.

THERE has been a good deal of typhoid in Edmonton throughout September and October. The milk supply is suggested as a possible source of infection. Early in October almost one hundred patients were undergoing treatment in the various hospitals of the city.

THERE are over one hundred patients in the Calgary General Hospital who are suffering from typhoid fever. Both the General and the Holy Cross Hospitals are overcrowded, and at present over sixty patients are receiving treatment in the General Hospital for whom there is no room in the wards: they have been placed in cots in the corridors and on the balconies.

HOSPITALS are to be built at Sedgewick, Alta., and at Davidson, Sask.

THE new St. Paul's Hospital, which is in course of construction at Saskatoon, will be four storeys in height and will give accommodation for one hundred and seventy-five patients. The present hospital building will be converted into a nurses' home.

THE question of building a hospital at Edson, Alberta, is under consideration. The population of the town is one thousand five hundred, and the only hospital is a small one which provides accommodation for five patients only.

THE regulations of the Ontario Public Health Act require that all private hospitals shall take out provincial licenses. In making application for a license, the hospital must give information concerning its financial condition, the accommodation of its building, its sanitary, ventilation, and heating arrangements, its water supply, and the facilities for escape in case of fire. These regulations came into force on October 1st, last, and any private hospital that ne-

glects to provide itself with the necessary license is liable to a fine of twenty-five dollars a day.

EIGHT hundred dollars has been given by Major R. W. Leonard, with which to build a cottage on the grounds of the Sir Oliver Mowat Memorial tuberculosis hospital at Kingston. The cottage is to be called the "Rowland Cottage."

WHOOPING COUGH and measles were very prevalent in Ontario during September. On the other hand, only four cases of smallpox occurred, which is the smallest number of cases of this disease which have been reported in any one month for thirteen years.

THERE has been comparatively little typhoid fever in Toronto this year. From January 1st to September 31st, one hundred and eighty-nine cases were reported, whereas during the same period in 1911, there were three hundred and eighty-five cases, and in 1910, five hundred and eighty-eight. During the month of September this year, fifty-one cases were reported: this compares favourably with last year's record, when ninety cases were reported during the same month.

THE necessary funds are being collected with which to erect a hospital at Ganges, on Salt Spring Island, B.C.

THE Prince County Hospital at Summerside, P.E.I., was opened recently. The cost of the building and equipment has been about \$12,000. The site on which the hospital is built and the lot of land adjoining it were given by residents of Summerside.

THE hospital at Humboldt, Saskatchewan, was opened October 3rd, last. The cost of the hospital has been \$35,000.

ONE hundred and five patients were admitted to the Moose Jaw Hospital during September; thirty-five of these were cases of typhoid. During the same month, one hundred and twenty cases of typhoid were treated in the Saskatoon Hospital. It has been difficult to provide accommodation for all the patients, and the construction of a new hospital at Saskatoon is looked forward to with relief. The new building will be placed in the university grounds, and, when completed, will be able to accommodate one thousand patients. The cost will be about \$1,000,000.

IN spite of higher matriculation requirements a hundred and twenty students have registered in the first year medicine at Toronto University.

DR. B. P. WATSON, F.R.C.S. Edin., has been appointed to the chair of gynaecology and obstetrics in the University of Toronto. Dr. Watson, who has acted as assistant to Professors Barbour and Simpson, of Edinburgh, will preside over the combined departments of the late Dr. T. F. W. Ross and Dr. Adam Wright, who has resigned.

BY a new arrangement in regard to the teaching in the medical department of the University of Toronto, each student, while clinical clerk, will live in Toronto General Hospital for three weeks.

A NEW Foundling and Baby Hospital is to be built at Montreal. The present building, which has been in use for twenty-one years, is not now large enough for the work of the hospital, and a building fund of over fifty thousand dollars has already been subscribed. The new building will provide room for one hundred cots and will be situated near McGill University, where the site has been definitely settled.

THE annual meeting of the directors of the Ottawa General Hospital took place on Tuesday, October 8th. On this occasion it was resolved to enlarge the hospital and the Lady Stanley Institute, and an earnest appeal is to be made to the public to help in collecting the necessary funds. The east wing of the hospital has already been extended and sun rooms and a roof garden have been provided at a cost of nearly ten thousand dollars. But, in order to meet the increasing demands for admission to the hospital on the part of patients, the hospital must be still further enlarged, and to do this a sum of two hundred thousand dollars will be required.

FOUR HUNDRED AND FIFTY-EIGHT deaths were registered in Toronto in September last, a death rate of 12·4 per thousand of population, and of these one hundred and seventy-five were under one year of age. Fifty-two cases of typhoid fever were reported, ten of which were fatal.

FOUR cases of typhoid have been reported from Port Hope, Ontario.

A SERIOUS epidemic of diphtheria has broken out among the Indians at Turtle Lake, Ontario. Several deaths have already occurred.

THE medical examination of forty-one thousand children in the Toronto schools has resulted in the detection of sixty-two cases of contagious disease, including two cases of tuberculosis, four of diphtheria, and one of scarlet fever. The dental examination revealed the fact that out of fifty-two children examined, the mouths of thirty were in bad condition.

SEVENTEEN cases of typhoid fever have been reported in South Vancouver. The milk supply is spoken of as a possible source of the infection. It is stated that one milk vendor continued to conduct his business while suffering from the fever.

DR. JOHN STEWART, Dr. A. W. H. Lindsay, and Professor Fraser Harris have been chosen to represent the province of Nova Scotia on the Dominion Medical Board.

A SITE has been purchased at Medicine Hat on which to erect a Roman Catholic hospital.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Journal of Medicine and Surgery, October, 1912:

Address in surgery Arthur E. Giles.

The President's address at the annual meeting of the Canadian Medical Association H. G. Mackid.

The Canadian Practitioner and Review, September, 1912:

Constipation Helen MacMurchy.

Two cases of angioneurotic eruption due to aspirin H. B. Anderson.

My personal experience with the use of nitrogen gas in the treatment of pulmonary tuberculosis Angus McKinnon.
 A medical commission John Hunter.

The Public Health Journal, September, 1912:

Municipal powers in dealing with town planning schemes	R. A. Outhet.
Modern public health teaching and practice in relation to the control of tuberculosis	F. F. Wesbrook.
Methods adopted by the city of Saskatoon for the purification of domestic water supply	G. T. Clark.
Municipal food inspection	P. B. Tustin.
Notification of phthisis	D. A. Craig.
Hypochlorite treatment of water for a temporary auxiliary water supply	E. A. James.

Le Journal de Médecine et de Chirurgie, September, 1912:

Valeur actuelle de la thérapeutique antituberculeuse	L. Venon.
Tumeur du sein	P. Delbet.
Ulcérations linguales	Dr. Potherat.
L'antisepsie buccale par l'Iode	M. P. Carles.
Lésions rénales unilatérales compliquées d'urémie	J. Castaigne.
Le végétarisme et les idées actuelles sur le rôle de la digestion	Professor Gley.

Dominion Medical Monthly, October, 1912:

Hyperextension of the knee following hip disease	B. E. McKenzie.
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Le Bulletin Médical de Québec, September, 1912:

L'expertise médico-légale et les réformes que l'on pourrait y apporter	A. Vallée.
Appendicite simple ou endo-appendicite	E. Couillard.

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The University of Toronto Medical Bulletin, July, 1912:

Neuritis of the external popliteal nerve following typhoid fever R. D. Rudolf.

Laboratory tests in the diagnosis of general paresis . C. S. McVicar, Gordon Bates, and G. S. Strathy.

Salvarsan in pernicious anæmia with reports of two cases treated simultaneously . . . W. B. Thistle.

Juvenile parasyphilitic affections . . . G. W. Howland.

A case of acromegaly . . . G. Chambers, H. A. Bruce, and J. J. Mackenzie.

Dislocation of the patella, with rotation about a horizontal axis W. J. O. Malloch.

A method of preserving the finger in a case of enchondroma of a phalanx, complicated by fracture A. Primrose.

A treatment of fracture of the upper extremity and shaft of the humerus W. E. Gallie.

Report of a case of fracture of the tibia and fibula, treated first by plaster splints and later by plating E. Stanley Ryerson.

A case of carcinoma arising from a lupus scar . G. Chambers.

A case of typhoid fever complicated by epididymitis and polyarthritis G. Chambers and C. E. Cooper Cole.

Notes on a case of regularly-recurring ventricular extra-systole G. W. Ross.

Medical Societies

VALLEY MEDICAL SOCIETY

A SUCCESSFUL meeting of the Valley Medical Society took place at Kentville, Nova Scotia, on September 18th last, on which occasion between twenty-five and thirty members were present. An interesting address was given by Dr. Mellar, the superintendent of the Kentville Sanatorium, and papers were read by Dr. James Ross, Dr. L. R. Morse, and Dr. John Stewart.

The midwinter session of the society will be held at Bridgetown, Nova Scotia.

CAPE BRETON MEDICAL SOCIETY

THE annual meeting of the Cape Breton Medical Society was held in the municipal council chamber, Sydney, on Wednesday, September 24th. The presidential address was given by Dr. G. H. Murphy, of Dominion. Papers were then read by Dr. Kendall, Dr. E. O. McDonald, Dr. M. T. McLean, Dr. R. C. McLeod, and Dr. M. D. Morrison. These were followed by two case reports, presented by Dr. Sullivan and Dr. McDonald.

The election of officers for 1912-1913 resulted as follows: president, Dr. A. Love, of Sydney Mines; vice-president, Dr. J. K. McLeod, of Sydney; secretary-treasurer, Dr. J. Lynch, of Sydney.

MANITOBA MEDICAL COUNCIL

THE annual meeting of the Manitoba Medical Council was held in the medical library, Winnipeg, October 2nd. The officers elected for the year 1912-1913 are: president, Dr. McCharles, Manitou; vice-president, Dr. E. L. Pope, Winnipeg; treasurer, Dr. W. A. Gardner, Winnipeg; registrar, Dr. J. S. Gray, Winnipeg. Dr. Thornton, Deloraine; Dr. McCalman, Dr. J. S.

Gray, and Dr. W. A. Gardner are the representatives of the university. Dr. Thornton and Dr. Gray were chosen as representatives to the Dominion Medical Council.

WINNIPEG MEDICO-CHIRURGICAL SOCIETY

THE regular monthly clinic at the Winnipeg General Hospital was held October 7th. Dr. S. W. Prowse presented a case of conical cornea. Dr. H. P. H. Galloway presented two cases of Potts' disease of the spine on which Alabee's operation was done with very good results. Dr. Fred. Young presented a case of hæmiplegia due to syphilitic thrombosis. Dr. J. Halpenny presented three cases of general peritonitis; (a) typical perforation; (b) ruptured pyosalpynx; (c) ruptured appendix. Dr. Chas. Hunter presented a case of erythromelalgia and a case of auricular fibrillation. Dr. J. R. Davidson presented a case of a large upper abdominal tumour for diagnosis. This case had been to other clinics and had returned without a diagnosis. Dr. S. J. S. Peirce presented pathological specimens: (a) acute dilatation of the stomach and duodenum occurring in typhoid fever; (b) decidioma malignum; (c) gas cyst of the mesentery in an infant six weeks old.

TORONTO ACADEMY OF MEDICINE

THE monthly general meeting of the Toronto Academy of Medicine was held on Tuesday, October 1st, in the Academy building. The meeting was the occasion of the presentation by Dr. McCullough of a volume of clinical records of women patients treated in the Edinburgh Royal Infirmary during the years 1787 and 1788 in the service of Dr. Gregory, chief clerk Simon Frazer. In making the presentation of this interesting volume, Dr. McCullough made some reference to the work of the physician in question.

Following Dr. McCullough, Dr. R. A. Reeve, the newly elected president, delivered his inaugural address, choosing as his subject, "Remarks on the value and the fallacies of statistics." The paper was a most interesting one.

The final address of the evening was a brief one, delivered by Sir Hector Clare Cameron, emeritus professor of surgery in the University of Glasgow, on the treatment of abscesses. Sir Hector made especial reference to the historical aspect of antiseptic surgery, and quoted largely from results of his own experience in the treatment of ordinary mammary and cold abscesses. Dr. Powell proposed a vote of thanks, which was carried, after which the president and Sir Hector Cameron held an informal reception. The attendance was one hundred and fifty.

SECTION OF MEDICINE. The monthly meeting of the Section of Medicine was held on Tuesday, October 8th. Dr. H. B. Anderson, chairman of the section for the ensuing year, briefly outlined the character of the work to be undertaken during the winter months, after which the speaker of the evening, Dr. Frederick B. Price, of London, was introduced.

Dr. Price's subject was "Recent advances in the diagnosis, prognosis, and treatment of heart disease." The following is a synopsis of this paper: Cardiac arrhythmia and the action of digitalis in heart conditions should be studied by the polygraph and micro-cardiograph. Arrhythmia due to extra-systole might be of little importance, while irregularity due to lack of conduction by the bundle of His might be of the greatest significance. In the treatment of heart conditions the beneficial action of digitalis is almost confined to cases of auricular fibrillation, as is shown by a number of cases under observation at Mount Vernon Hospital. The amount should be large at first, doses of one to three drams per day being used. The proper quantity for each patient, however, should be judged by the amount under which they do best. Digitalis should be kept up for the rest of their lives. It should be prohibited in cases where there is any fever. The paper was discussed by Professor McPhedran, Drs. E. W. Ross, Graham Chambers, Rudolf, and Mackenzie. After the meeting a reception was given to Dr. Price.